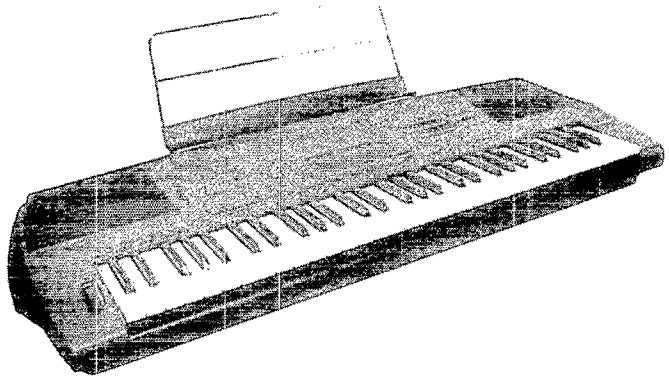
ORDER NO.EMID981689
A5

# Service Manual

## PCM Keyboard

# SX-KN930

(M),(MC),(XM),(EN),(EH),(EF),(EZ),(EW),(EA)
(EP),(EK),(XL),(XR),(XS),(XD),(XT),(X),(XP)



**AREAS**

(M): U.S.A.
(MC): Canada
(XM): Mexico
(EN): Norway,Sweden, Denmark,Finland
(EH): Holland,Belgium
(EF): France,Italy
(EZ): Germany
(EW): Switzerland
(EA): Austria
(EP): Spain,Portugal, Greece,Singapore, South Africa
(EK): the United Kingdom
(XL): New Zealand
(XR): Australia
(XS): Malaysia
(XD): Saudi Arabia,Hong Kong,Kuwait
(XT): Taiwan
(X): Thailand,Indonesia, Iran,U.A.E.,Panama, Argentina,Peru,Brasil
(XP): Philippines

The SX-KN930 is the same as the SX-KN920 with some modifications. This Service Manual covers only those parts which have been modified from the SX-KN920. For other parts, refer to the SX-KN920 Service Manual(Order No.EMID961616), the Supplement(EMID971661)and Parts Change Notice(EMID971662,EMID971664).Please keep this manual with and use it in conjunction with the SX-KN920 Service Manual ,Supplements and Parts Change Notice.

**⚠ WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians.Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

## ■Specifications

| | |
|---|---|
| KEYBOARD | 61 KEYS (WITH INITIAL TOUCH) |
| SOUND GENERATOR | PCM |
| MAXIMUM NUMBER OF NOTES PRODUCED SIMULTANEOUSLY | 32 NOTES |
| SOUNDS | 200 SOUNDS |
| EFFECTS | DIGITAL EFFECT, DSP EFFECT, SUSTAIN, DIGITAL REVERB |
| SOUND EDIT | MEMORY: 40 |
| TRANSPOSE | G - C - F# |
| RHYTHM | 128 × 4 VARIATIONS |
| CONTROLS | MAIN VOLUME, BALANCE, MUTE, SPLIT POINT, CONDUCTOR START/STOP, INTRO & ENDING 1,2, FILL IN 1,2, COUNT INTRO, SYNCHRO & BREAK, TEMPO |
| MANUAL SEQUENCE PADS | 12 BANK × 6 PADS, 1 USER BANK: 1200 NOTES, RECORD/STOP |

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| | |
|---|---|
| AUTO PLAY CHORD | MODE: ONE FINGER, FINGERED, PIANIST, MEMORY, ON BASS, MUSIC STYLE ARRANGER, SOUND ARRANGER |
| ONE TOUCH PLAY | O (ONE TOUGH PLAY/MUSIC STYLE SELECT) |
| TECHNI-CHORD | O |
| PANEL MEMORY | 2 BANKS × 5 |
| SEQUENCER | 16 TRACKS, 10 SONGS<br>RESOLUTION: 96 PULSES PER QUARTER - NOTE<br>STORAGE CAPACITY: APPROX. 30000 NOTES<br>RECORD MODES: EASY, REALTIME, STEP (CHORD, RHYTHM)<br>FUNCTIONS: TRACK ASSIGN, EDIT, SONG SELECT/NAME, MEDLEY |
| COMPOSER | 5 PARTS: BASS,ACCOMP 1,2,3, DRUMS<br>STORAGE CAPACITY: APPROX. 10000 NOTES<br>FUNCTIONS: BEND RANGE, MODE SELECT, PATTERN COPY, SINGLE LOAD, CHORD MAP<br>MEMORY: 3 BANDS × 10 (VARIATION 1 - 4, INTRO 1,2, FILL IN 1,2, ENDING 1,2) |
| MEMORY & CONTROL | INITIAL, FOOT SWITCH SET, DIRECT PLAY,<br>DISK LOAD, DISK SAVE, DISK FORMAT, CONTRAST |
| SOUND SETTING | PART SETTING, KEY SCALING, TOUCH & TUNE, LEFT HOLD |
| MIDI | CHANNEL, PART SETTING, COMMON SET, CONTROL MESSAGE, IN/OUT SET,<br>REALTIME MESSAGE, MIDI PRESETS, GM MODE, BULK DUMP |
| EXTERNAL MEMORY | BUILT - IN 3.5 INCH FLOPPY DISK DRIVE FOR 2HD (1.44 MB), 2DD (720KB) |
| DISPLAY | LCD (PAGE, EXIT, DISPLAY HOLD) |
| DEMO | O |
| TERMINALS | PHONES/LINE OUT, FOOT SW, MIDI (IN OUT), DC IN 12 V |
| OUTPUT | 1.5 W × 2 (WITH BATTERIES), 8W × 2 (WITH SY-AD6/AD6B AC ADAPTOR) |
| SPEAKERS | 12 cm × 2 |
| POWER REQUIREMENT | BATTERIES: DC 9 V (USING R20/LR20 ["D" SIZE, UM-1] BATTERIES × 6 |
| | AC: WITH SY-AD6 AC ADAPTOR AC 120/220/230/240V 50/60Hz<br>AC120V 60Hz(NORTH AMERICA AND MEXICO)<br>AC: WITH SY-AD6B AC ADAPTOR AC230V 50/60Hz(EUROPE EXCEPT FOR UNITED KINGDOM) |
| DIMEMSIONS(W × H × D) | 105.7cm × 14.9cm × 40.4cm (41 - 5/8" × 5 - 7/8" × 15 - 29/32) WITH OUT MUSIC STAND, BATTERIES |
| NET WEIGHT | 8.8kg (19.4lbs.) WITHOUT MUSIC STAND, BATTERIES |
| ACCESSORIES | MUSIC STAND |

· Specifications are subject to change without notice for further improvement.

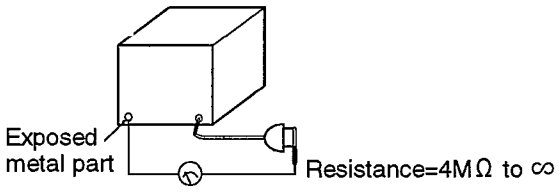
# SAFETY PRECAUTION

## ● Safety Precaution

1. Before servicing,unplug the power cord to prevent an electric shock.
2. When replacing parts,use only the manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing,be sure to restore the lead dress,insulation barriers,insulation papers,shields,etc..
5. Befor returning the serviced equipment to the customer,be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

## ● Insulation Resistance Test

1. Unplug the power cord and short the prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part,such as screw heads,connectors,control shafts,handle brackets,etc..Measurements should range from 4MΩ to infinity for all exposed parts.



# WARNING

To prevent the risk of fire, smoke, or electrical shock and to ensure safe operation, please be sure to follow the safety guidelines below.

1. At places where special caution is required, the necessary safety precautions are clearly labeled or printed, for example, on the cabinet, or on the part concerned. Please follow these safety precautions, and also those listed in the Owner's Manual.
2. Parts which have a ⚠ mark in the circuit diagram or in the parts list are essential for safety. When replacing these parts, be sure to use only the specified parts.
3. Use the specified types for internal wiring(double-insulated wiring,etc.).
4. When replacing parts on the AC primary side(power transformer, electric switch, electrical cord, noise-prevention condenser, etc.), wind the lead wire and secure it by soldering.
5. Do not let the wiring come into contact with heat-emitting devices(fuse resistor, radiator plate,etc.).
6. When replacing the wiring, make sure that it is not in contact with the unfinished or rough edge of a part.
7. When replacing the power cord(except for the plug-in type), tug it from various directions to confirm that it does not slip out of place.
8. Spacing
   If soldering was done on the AC primary circuit, confirm that the interval between the soldered terminals or between the terminal and surrounding metallic parts is at least the minimum required (Between the primary circuit and the chassis: at least 6.5mm; between primary circuit terminals: at least 4.0mm; between primary circuit terminals and secondary circuit terminals:at least 6.5mm.).

# MODIFICATIONS

## 1.PRINTED CIRCUIT BOARD

■ **PRINTED CIRCUIT BOARD**(Refer to PageIII-1)

| RTL | | Area | Parts No. | | Description | P/S | Remark |
|---|---|---|---|---|---|---|---|
| | | | SX-KN920 | **SX-KN930** | | | |
| ○ | RTL | EN EK EZ EW EF EA EP EH X XL XR XS XD XT XP MC | SXPG226781 | **SXPG2267101** | MAIN | 1 | Changed |
| ○ | RTL | M XM | SXPG226741 | **SXPG226791** | MAIN | 1 | Changed |
| ○ | RTL | | SXPG226921 | **SXPG226941** | FAJ | 1 | Changed |

## 2.MAIN CIRCUIT

The programmed ROMs have been modified. The part number of the MAIN P.C.B. has been changed also.

MAIN **MAIN CIRCUIT**(Refer to PageIII-1)

| Ref.No. | | Parts No. | | Description | P/S | Remark |
|---|---|---|---|---|---|---|
| | | SX-KN920 | **SX-KN930** | | | |
| IC | | | | | | |
| ○ | IC15 | QSIGX3C32010 | **QSIGX3C32014** | 32M BIT MASK ROM | 1 | Changed |
| ○ | IC25 | QSIGU3C32397 | **QSIGX3C32012** | 32M BIT MASK ROM | 1 | Changed |

# 3.FAJ CIRCUIT

Some registers and capacitors have been modified. The part number of the FAJ P.C.B. has been changed also.

**FAJ FAJ CIRCUIT**(Refer to PageIII-3)

| Ref.No. | Parts No. | | Description | P/S | Remark |
|---|---|---|---|---|---|
| | SX-KN920 | **SX-KN930** | | | |
| RESISTORS | | | | | |
| R53,54 | ERDS2TJ124 | **ERDS2TJ683** | 68KΩ | 2 | Changed |
| R61,62 | ERDS2TJ682 | **ERDS2TJ472** | 4.7KΩ | 2 | Changed |
| R79,80 | ERDS2TJ682 | **ERDS2TJ103** | 10KΩ | 2 | Changed |
| CAPACITORS | | | | | |
| C27,28 | ECQG1H682KZ | **ECQG1H332KZ** | 0.0033μF | 2 | Changed |

# 4.CABINET PARTS

Cabinet body have been modified.

**■CABINET PARTS**(Refer to PageIII-7)

| Ref.No. | Parts No. | | Description | P/S | Remark |
|---|---|---|---|---|---|
| | SX-KN920 | **SX-KN930** | | | |
| CABINET PARTS | | | | | |
| ○ 6 | QYPG1071BAK | **QYPG1071BBK** | CABINET BODY | 1 | Changed |

# 5.PACKING PARTS

Packing case have been modified.

**■PACKING PARTS**(Refer to PageIII-9)

| Ref.No. | Parts No. | | Description | P/S | Remark |
|---|---|---|---|---|---|
| | SX-KN920 | **SX-KN930** | | | |
| PACKING PARTS | | | | | |
| ○ 8 | QPGG0348AAK | **QPGG0403AAK** | PACKING CASE,PAPER | 1 | Changed |

# 6.OPERATING INSTRUCTION MANUAL

Operating instruction manual have been modified.

**■OPERATING INSTRUCTION MANUAL**(Refer to PageIII-9)

| Ref.No. | Parts No. | Description | P/S |
|---|---|---|---|
| OPERATING INSTRUCTION MANUAL | | | |
| ○ 9 | QQFGKN930AA | OPERATING INSTRUCTION MANUAL, EN | 1 |
| ○ 9 | QQFGKN930BA | OPERATING INSTRUCTION MANUAL, M | 1 |
| ○ 9 | QQFGKN930CA | OPERATING INSTRUCTION MANUAL, MC | 1 |
| ○ 9 | QQFGKN930DA | OPERATING INSTRUCTION MANUAL, EZ | 1 |
| ○ 9 | QQFGKN930EA | OPERATING INSTRUCTION MANUAL, EK | 1 |
| | | XL XR XS | 1 |
| ○ 9 | QQFGKN930FA | OPERATING INSTRUCTION MANUAL, EW | 1 |
| ○ 9 | QQFGKN930GA | OPERATING INSTRUCTION MANUAL, EF | 1 |
| ○ 9 | QQFGKN930HA | OPERATING INSTRUCTION MANUAL, EA | 1 |
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| | | XP XM X | |
| ○ 9 | QQFGKN930KA | OPERATING INSTRUCTION MANUAL, EH | 1 |
| ○ 9 | QQFGKN930MA | OPERATING INSTRUCTION MANUAL, XD | 1 |
| ○ 9 | QQFGKN930NA | OPERATING INSTRUCTION MANUAL, XT | 1 |

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ORDER NO. EMID961616
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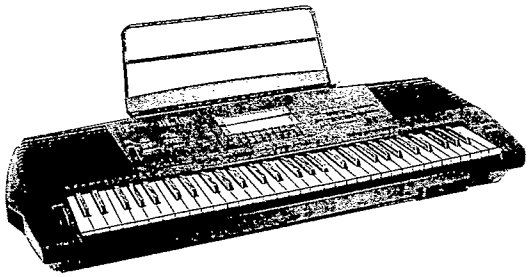
# Service Manual

PCM Keyboard

# SX-KN920



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(XP): Philippines

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## ■ Specification

| | |
|---|---|
| KEYBOARD | 61 KEYS (WITH INITIAL TOUCH) |
| SOUND GENERATOR | PCM |
| MAXIMUM NUMBER OF NOTES PRODUCED SIMULTANEOUSLY | 32 NOTES |
| SOUNDS | 200 SOUNDS |
| EFFECTS | DIGITAL EFFECT, DSP EFFECT, SUSTAIN, DIGITAL REVERB |
| SOUND EDIT | MEMORY : 40 |
| TRANSPOSE | G–C–F# |
| RHYTHM | 128 × 4 VARIATIONS |
| CONTROLS | MAIN VOLUME, BALANCE, MUTE, SPLIT POINT, CONDUCTOR<br>START/STOP, INTRO & ENDING 1,2, FILL IN 1,2, COUNT INTRO, SYNCHRO & BREAK, TEMPO, |
| MANUAL SEQUENCE PADS | 12 BANKS × 6 PADS, 1 USER BANK: 1200 NOTES, RECORD/STOP |
| AUTO PLAY CHORD | MODE : ONE FINGER, FINGERED, PIANIST, MEMORY, ON BASS, MUSIC STYLE ARRANGER, SOUND ARRANGER |
| ONE TOUCH PLAY | ○ (ONE TOUCH PLAY/MUSIC STYLE SELECT) |
| TECHNI-CHORD | ○ |
| PANEL MEMORY | 2 BANKS × 5 |
| SEQUENCER | 16 TRACKS, 10 SONGS<br>RESOLUTION : 96 PULSES PER QUARTER-NOTE<br>STORAGE CAPACITY : APPROX. 30000 NOTES<br>RECORD MODES : EASY, REALTIME,STEP(CHORD,RHYTHM)<br>FUNCTIONS : TRACK ASSIGN, EDIT, SONG SELECT/NAME,MEDLEY |
| COMPOSER | 5 PARTS : BASS, ACCOMP 1,2,3, DRUMS<br>STORAGE CAPACITY : APPROX. 10000 NOTES<br>FUNCTIONS : BEND RANGE, MODE SELECT, PATTERN COPY, SINGLE LOAD, CHORD MAP<br>MEMORY : 3 BANDS × 10(VARIATION 1–4, INTRO 1,2, FILL IN 1,2, ENDING 1,2) |

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| | |
|---|---|
| MEMORY & CONTROL | INITIAL, FOOT SWITCH SET, DIRECT PLAY,<br>DISK LOAD, DISK SAVE, DISK FORMAT, CONTRAST |
| SOUND SETTING | PART SETTING, KEY SCALING, TOUCH & TUNE, LEFT HOLD |
| MIDI | CHANNEL, PART SETTING, COMMON SET, CONTROL MESSAGE, IN/OUT SET,<br>REALTIME MESSAGE, MIDI PRESETS, GM MODE, BULK DUMP |
| EXTERNAL MEMORY | BUILT-IN 3.5 INCH FLOPPY DISK DRIVE FOR 2HD(1.44 MB), 2DD (720 KB) |
| DISPLAY | LCD (PAGE, EXIT, DISPLAY HOLD) |
| DEMO | ○ |
| TERMINALS | PHONES/LINE OUT, FOOT SW, MIDI (IN, OUT), DC IN 12V |
| OUTPUT | 1.5W × 2 (WITH BATTERIES), 8W × 2 (WITH SY-AD6/AD6B AC ADAPTOR) |
| SPEAKERS | 12cm × 2 |
| POWER REQUIREMENT | BATTERIES: DC 9V (USING R20/LR20 ["D" SIZE, UM-1] BATTERIES × 6 |
| | AC: WITH SY-AD6 AC ADAPTOR — AC 120/220/230/240V 50/60Hz<br>AC 120V 60Hz (NORTH AMERICA AND MEXICO)<br>AC: WITH SY-AD6B AC ADAPTOR — AC 230V 50/60Hz (EUROPE EXCEPT FOR UNITED KINGDOM) |
| DIMENSIONS (W × H × D) | 105.7 cm × 14.9cm × 40.4cm (41-5/8" × 5-7/8" × 15-29/32) WITHOUT MUSIC STAND, BATTERIES |
| NET WEIGHT | 8.8kg (19.4lbs.) WITHOUT MUSIC STAND, BATTERIES |
| ACCESSORIES | MUSIC STAND |

•Specification are subject to change without notice for further improvement.

# WARNING

To prevent the risk of fire, or electrical shock and to ensure safe operation, please be sure to follow the safety guidelines below.

1. At places where special caution is required, the necessary safety precautions are clearly labeled or printed, for example, on the cabinet, or on the part concerned. Please follow these safety precautions, and also those listed in the Owner's Manual.
2. Parts which have a ⚠ mark in the circuit diagram or in the parts list are essential for safety. When replacing these parts, be sure to use only the specified parts.
3. Use the specified types for internal wiring (double-insulated wiring, etc.).
4. When replacing parts on the AC primary side (power transformer, electric switch, electrical cord, noise-prevention condenser, etc.), wind the lead wire and secure it by soldering.
5. Do not let the wiring come into contact with heat-emitting devices (fuse resistor, radiator plate, etc.).
6. When replacing the wiring, make sure that it is not in contact with the unfinished or rough edge of a part.
7. When replacing the power cord (except for the plug-in type), tug it from various directions to confirm that it does not slip out of place.
8. Spacing
   If soldering was done on the AC primary circuit, confirm that the interval between the soldered terminals or between the terminal and surrounding metallic parts is at least the minimum required (Between the primary circuit and the chassis: at least 6.5mm; between primary circuit terminals: at least 4.0mm; between primary circuit terminals and secondary circuit terminals: at least 6.5mm.).

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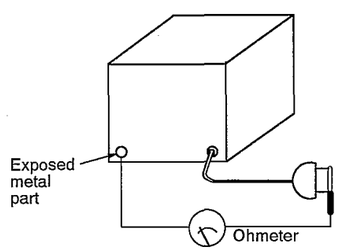
# SAFETY PRECAUTION

## ● Safety Precaution

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only the manufacture's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

## ● Insulation Resistance

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screw heads, connectors, control shafts, handle brackets, etc.. Measurements should range from 4MΩ to infinity for all exposed parts.

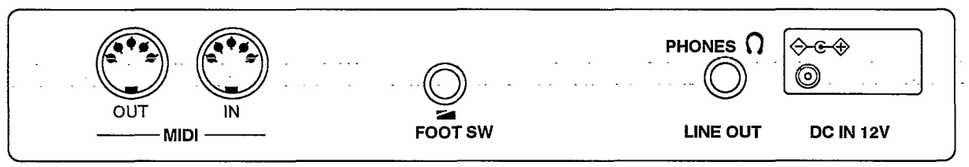



Resistance = 4M Ω to ∞



# TERMINALS

(Rear panel)




**FOOT SW**
An optional SZ-P1 Foot Switch (sold separately) can be connected to each terminal to control various functions.

**PHONES/LINE OUT** (output level 1.5 Vrms, 16 Ω )
Headphones, a keyboard amplifier, or stereo equipment can be connected to this terminal. When another apparatus is connected to this terminal, the speaker system is automatically switched off, and sound is heard only through the connected device.

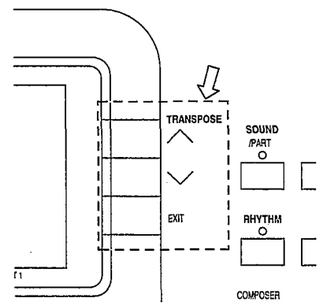
**MIDI**
These terminals are for connection to another MIDI instrument.

# INITIAL SETTING

■ The initial setting function is used to return to the original factory settings, and to reset the customer settings and misoperations.

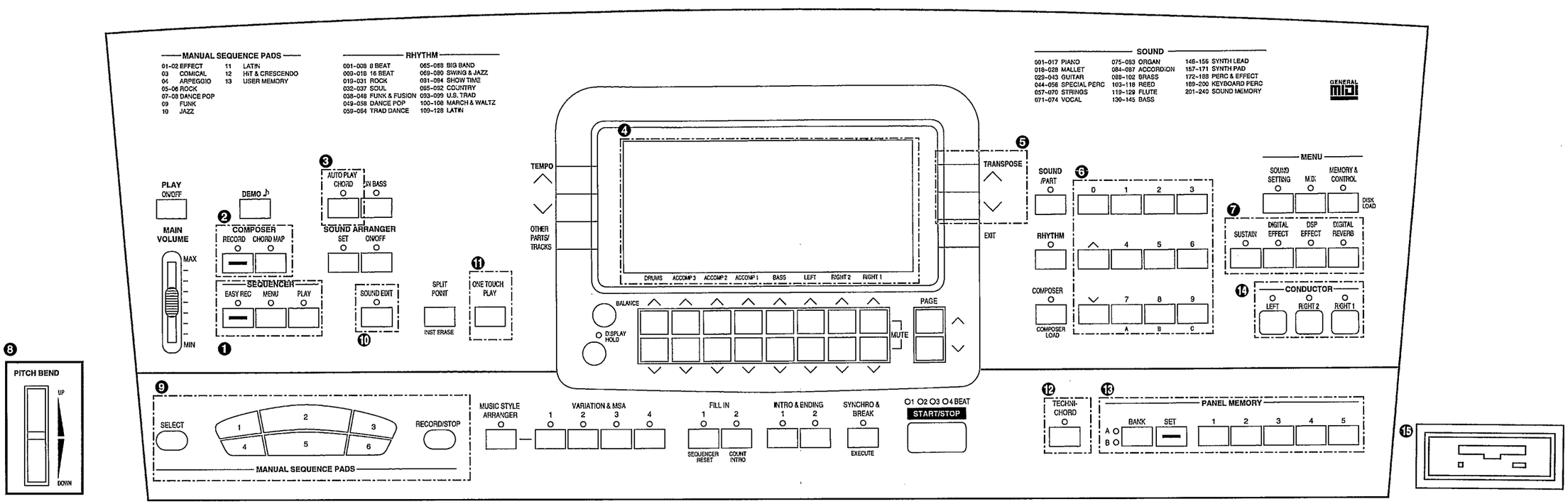
1. Press the **PLAY** button to turn off the instrument.

2. While pressing the three buttons to the right of the display, (**TRANSPOSE** ∧ and ∨ ,and **EXIT**) at the same time, turn the **PLAY** button on again.




**NOTE:**
All stored data in the **SEQUENCER** and **COMPOSER** and other setting are initialized with this operation.

# CONTROLS AND FUNCTIONS




**❶ SEQUENCER**
A sequencer records your performance in a similar way to a tape recorder. This instrument's **SEQUENCER** allows you to record up to 10 performances in a variety of ways.

**❷ COMPOSER**
The **COMPOSER** enables you to create your own accompaniment patterns or to edit preset accompaniment patterns. A pattern is comprised of five parts: **DRUMS, BASS** and three **ACCOMP** parts. These parts would form the backing of a song, for example: Drums, Accoustic Bass, Piano, Jazz Guitar and Vibes. You may find it useful at first to copy and edit a preset pattern.

**❸ AUTO PLAY CHORD**
Simply by playing a chord on the keyboard, the **AUTO PLAY CHORD** function automatically plays an accompaniment pattern which matches perfectly the selected rhythm. With a real accompaniment as a background, you can concentrate on playing the melody.

**❹ DISPLAY**
Displays performance information, function settings and other messages.

**❺ TRANSPOSE**
The **TRANSPOSE** buttons are used to changed the key of the entire instrument in semitone steps across an entire octave.

**❻ Number pad**
Use the number pad to select sounds and rhythms by their numbers.

**❼ Effects**
Add various effects to the sounds. **DIGITAL EFFECT** gives the sound richness and enhances your performance. **DSP EFFECT** adds unique quality to the sound. **SUSTAIN** is the gradual fading out of musical tones after the key is released. **DIGITAL REVERB** applies a reverberation effect to the sound.

**❽ PITCH BEND/MODULATION**
The pitch of the instrument can be continuously changed with the **PITCH BEND** wheel at left end of the keyboard. Using this control, you can produce the effect of bending the strings on a guitar.



**❾ MANUAL SEQUENCE PADS**
Add various phrases to your performance with the pad buttons.

**❿ SOUND EDIT**
**SOUND EDIT** enables you to create your own new sound by altering one of this instrument's preset sounds. Your new sound can be stored in one of the sound memory locations.

**⓫ ONE TOUCH PLAY**
**ONE TOUCH PLAY** sets up the your instrument with a suitable registration for your chosen rhythm style so that you can make a great sound straight away, even if you are playing this instrument for the first time. Using **ONE TOUCH PLAY** sets a suggested combination of sounds and balances and an appropriate tempo for the rhythm style at the push of a button.

**⓬ TECHNI-CHORD**
**TECHNI-CHORD** turns your single-note melodies into full chords and offers you a choice of 13 different types, from a simple duet which adds one harmony note to your melody note, to big band reeds which adds four harmony notes to your melody note.

**⓭ PANEL MEMORY**
**PANEL MEMORY** stores the panel set up of this instrument allowing you to make complex changes at the push of a single button.

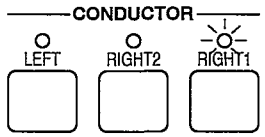
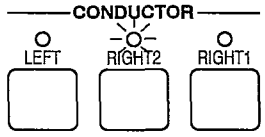
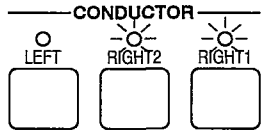
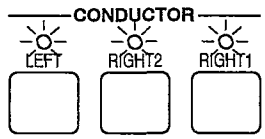
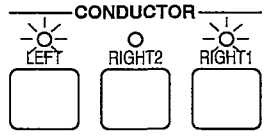
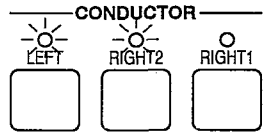
**⓮ CONDUCTOR**
The **CONDUCTOR** buttons are used to assign sounds to the keyboard in many different ways. For example, you can assign two sounds to the entire keyboard so that playing one key will produce two sounds. You can even split the keyboard into right and left sections (SPLIT), and assign a different sound to each section.

**⓯ DISK DRIVE**
This Disk Drive allows you to store **SEQUENCER** performance and other data on 3.5-in. 2DD/2HD memory disk.

# CONDUCTOR SETTINGS

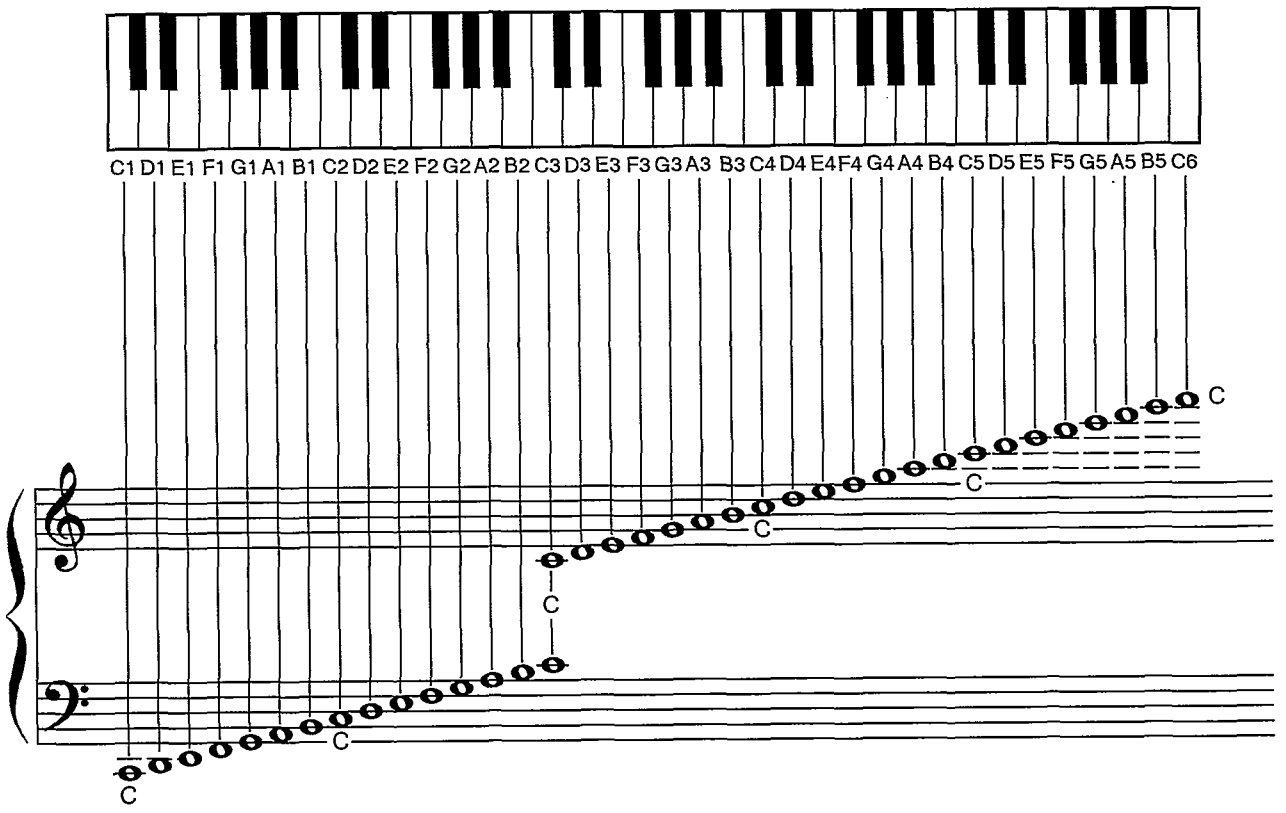
The **CONDUCTOR** buttons are used to assign sounds to the keyboard in many different ways. For example, you can assign two sounds to the entire keyboard so that playing one key will produce two sounds. You can even split the keyboard into right and left sections (**SPLIT**), and assign a different sound to each section.

## CONDUCTOR

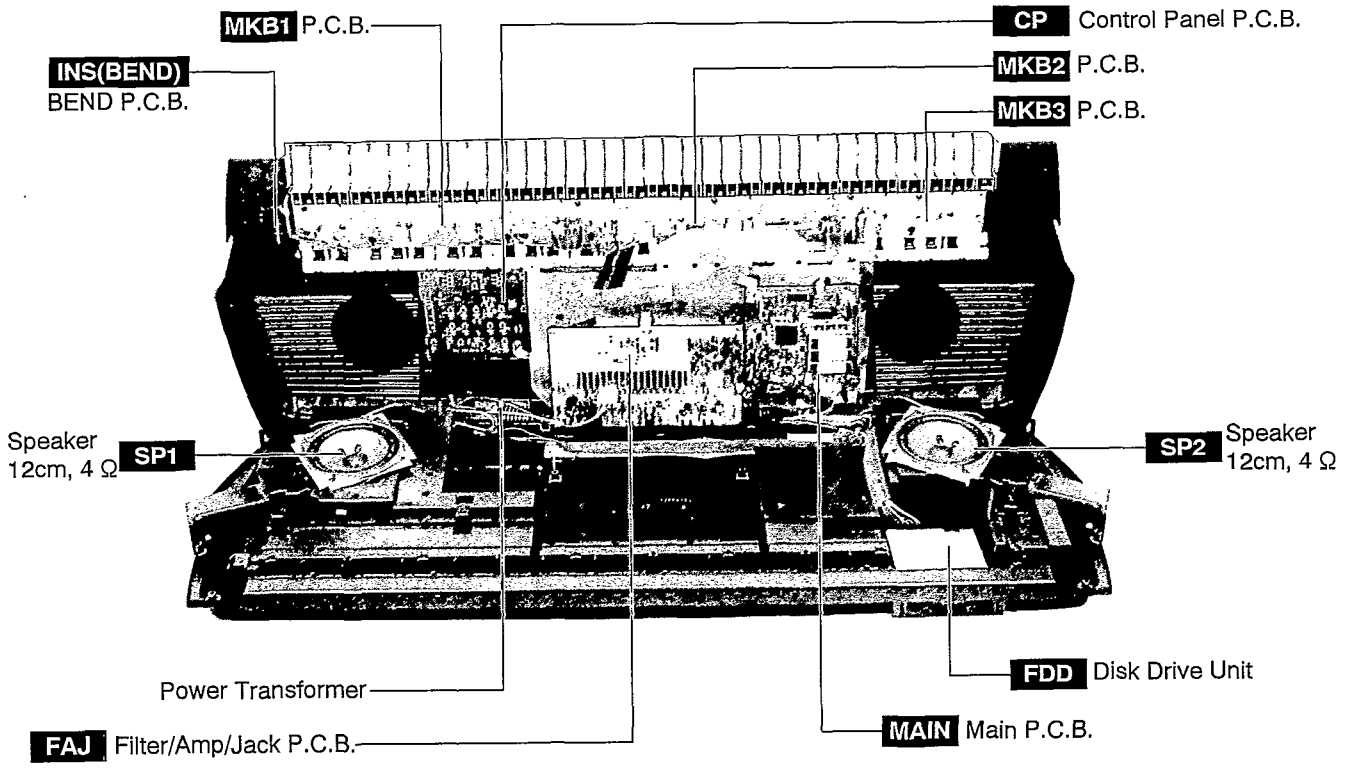
| **CONDUCTOR** settings | How sounds are assigned to the keyboard |
|---|---|
|  | All keys produce the **RIGHT1** sound.<br>**RIGHT 1** |
|  | All keys produce the **RIGHT2** sound.<br>**RIGHT 2** |
|  | All keys produce both the **RIGHT1** sound and the **RIGHT 2** sound.<br>**RIGHT 1 + RIGHT 2** |
|  | The left keys produce the **LEFT** sond and the right keys produce the **RIGHT 1** sound and the **RIGHT 2** sound.<br>**LEFT** / **RIGHT 1 + RIGHT 2** |
|  | The left keys produce the **LEFT** sond and the right keys produce the **RIGHT 1** sound.<br>**LEFT** / **RIGHT 1** |
|  | The left keys produce the **LEFT** sound and the right keys produce the **RIGHT 2** sound.<br>**LEFT** / **RIGHT 2** |

# KEYBOARD RANGES

This keyboard features Touch Response, by which you control the volume by playing the keys harder or softer.



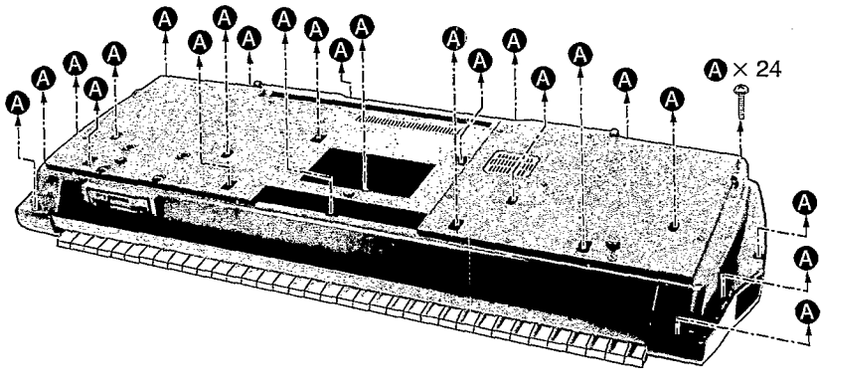

# PARTS LOCATION



# DISASSEMBLY INSTRUCTIONS

## 1 Opening the cabinet

1. Turn the keyboard cabinet upside down as shown in Fig. 1, and remove the bottom screws (Ⓐ 24 pcs.).
2. Place the keyboard bottomside down, and open the top cabinet.




[Fig. 1]

## 2 Removing the MAIN, FAJ, CP, LMP1, LMP2 and LCD printed circuit boards

• Open the cabinet (see step 1 ).

**MAIN P.C.B.**

• Remove the MAIN P.C.B. mounting scrwes (Ⓑ 4 pcs.).

**FAJ P.C.B.**

• Remove the FAJ P.C.B. mounting screws (Ⓒ 6 pcs. and Ⓓ 3 pcs.).

**CP P.C.B.**

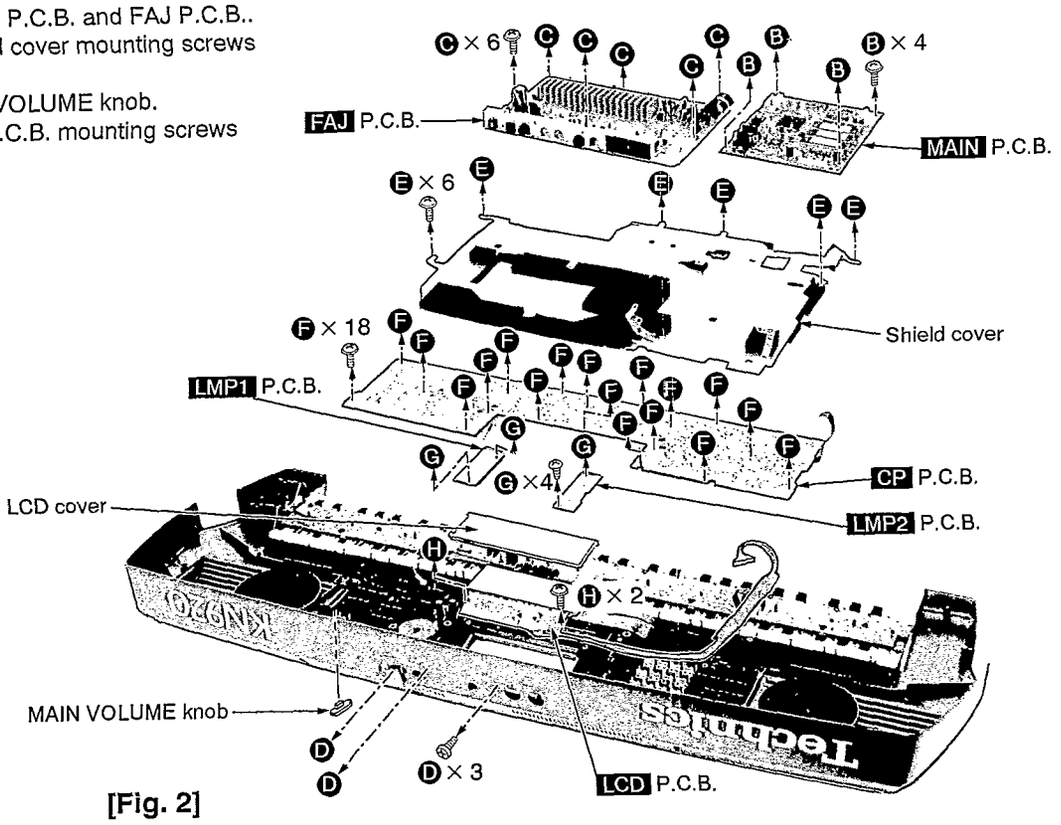
1. Remove the MAIN P.C.B. and FAJ P.C.B..
2. Remove the shield cover mounting screws (Ⓔ 6 pcs.).
3. Pull off the MAIN VOLUME knob.
4. Remove the CP P.C.B. mounting screws (Ⓕ 18 pcs.).

**LMP1, LMP2 P.C.B.**

1. Remove the MAIN, FAJ and CP P.C.B..
2. Remove the LMP1 and LMP2 P.C.B. mounting screw (Ⓖ 4 pcs.).

**LCD P.C.B.**

1. Remove the MAIN, FAJ, CP, LMP1, and LMP2 P.C.B..
2. Remove the LCD cover.
3. Remove the LCD P.C.B. mounting screws (Ⓗ 2 pcs.).




[Fig. 2]

## 3 Removing the INS, MKB1, MKB2 and MKB3 printed circuit boards

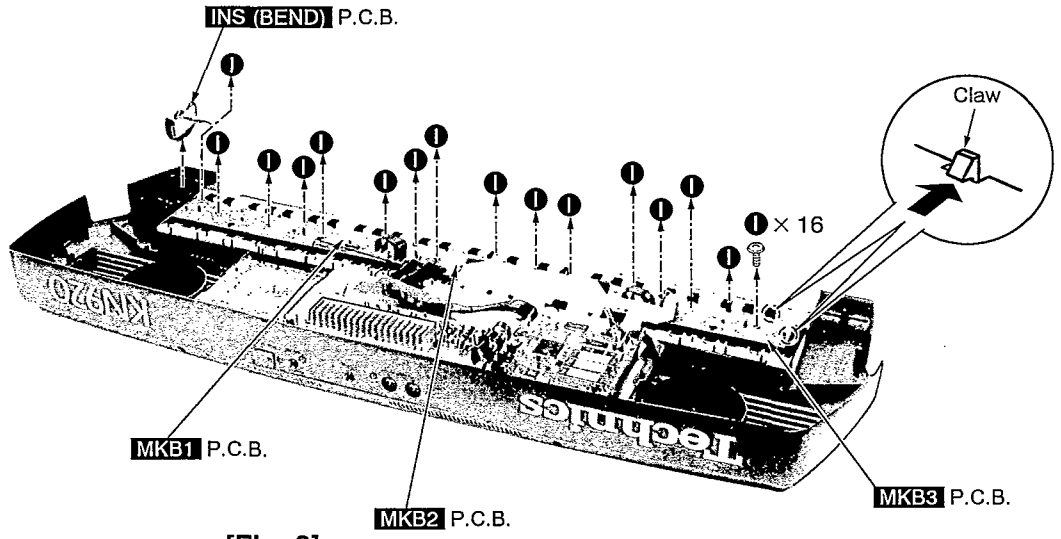
• Open the cabinet (see step 1)

**INS (BEND) P.C.B. Ass'y**

1. Pull out the INS P.C.B. ass'y from the cabinet.

**MKB1, MKB2, MKB3 P.C.B.**

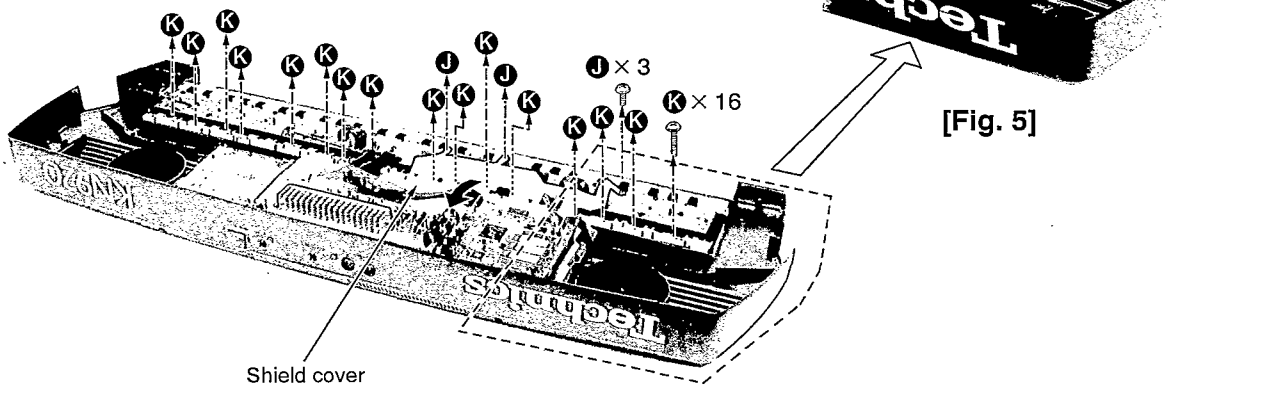
1. Remove the MKB1, MKB2 and MKB3 P.C.B. mounting screws (❶ 16 pcs.).
2. Release the claws (21 points).




[Fig. 3]

## 4 Removing the keyboard unit

1. Open the cabinet (see step 1)
2. Remove the shield cover mounting screws (❸ 3 pcs.), and then bend the shield cover in the direction of arrow.
3. Remove the keyboard unit mounting screws (❹ 16 pcs.).




[Fig. 5]



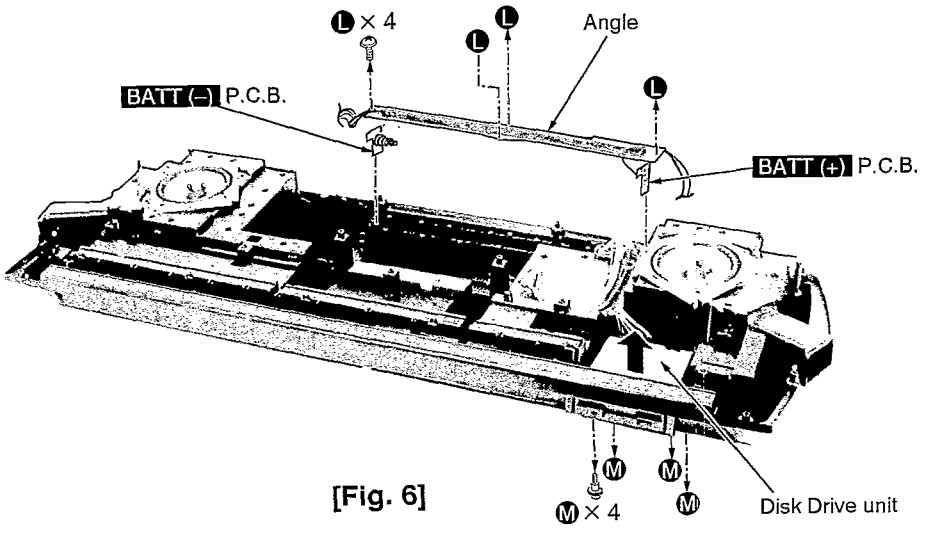

[Fig. 4]

## 5 Removing the BATT (+) and BATT (–) printed circuit board

1. Open the cabinet (see step 1 )
2. Remove the angle mounting screw ( Ⓛ 4 pcs.).
3. Pull out the BATT (+) and BATT (–) P.C.B. from the cabinet.

## 6 Removing the Disk Drive unit

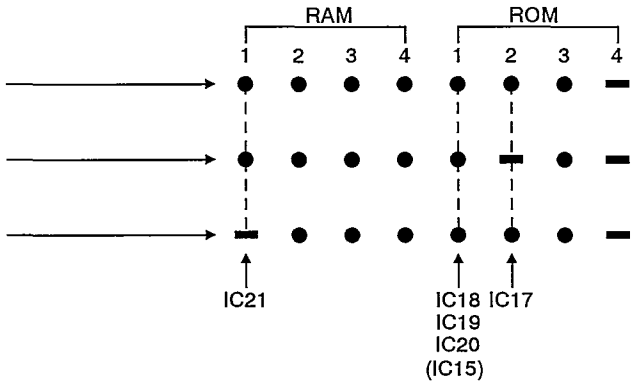
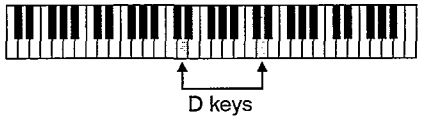
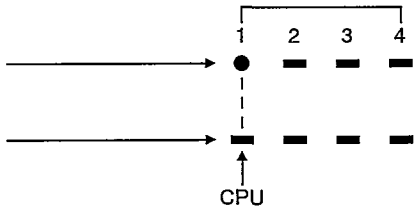
1. Open the cabinet (see step 1)
2. Remove the Disk Drive unit mounting screws ( Ⓜ 4 pcs.).

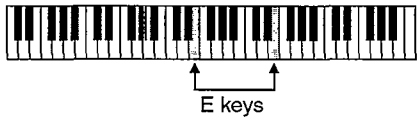
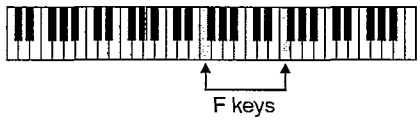
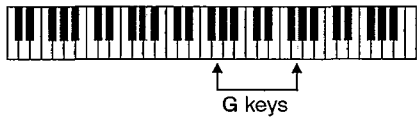



[Fig. 6]

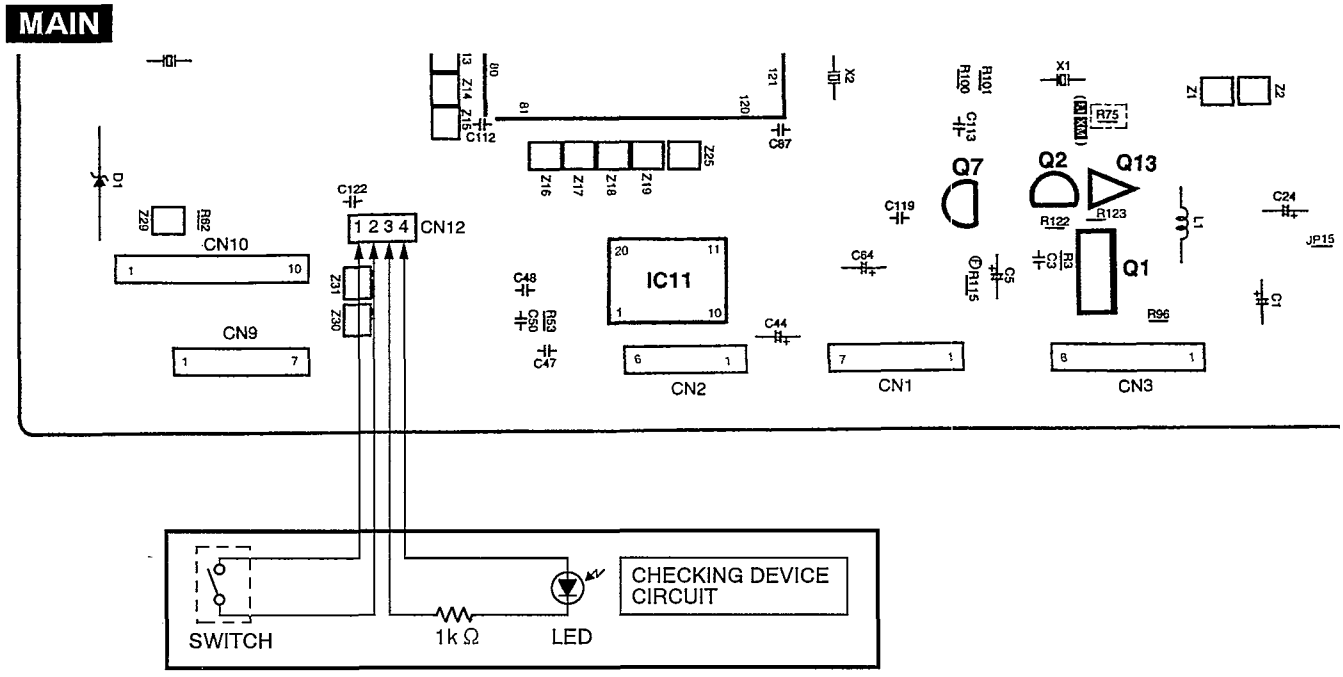
# ABOUT THE SELF-DIAGNOSTIC FUNCTION

This model has some self-diagnostic capabilities. When set to the self-diagnostic mode, operation of various components can be verified by following the procedures in the chart below.

<table>
<tr><th>No.</th><th>PCB</th><th>TEST MODE</th><th>Procedure</th></tr>
<tr><td>1</td><td>MAIN</td><td>RAM (IC21), ROM (IC15, IC17-20) check</td><td>1.Connect the CHECKING DEVICE (refer to page I-12) to CN12 on the MAIN P.C.B. , and turn on the CHECKING DEVICE switch.<br>2.Turn on the power switch.</td></tr>
<tr><td colspan="4">When the power switch is turned on, the LED of the CHECKING DEVICE flashes 8 times. The first 4 flashes are for the RAM check, and the latter 4 flashes are for the ROM check. The order of the LED flashes correspond to the respective IC numbers as shown below. If an IC is defective, the corresponding flash time is longer.<br>Examples<br>1. RAM OK, ROM OK<br>2. RAM OK, ROM(IC17) defective<br>3, RAM(IC21) defective, ROM OK<br>NOTE: ● indicates short flash time<br>▬ indicates long flash time<br> 
</td></tr>
<tr><td>2.</td><td>CP</td><td>Control panel CPU check</td><td>1.Connect the CHECKING DEVICE to CN 12 on the MAIN P.C.B. (The Checking Device switch should be off.)<br>2.Press and hold the two D keys shown below, and then turn on the power switch.<br> 
</td></tr>
<tr><td colspan="4">When the power switch is turned on, the LED of the CHECKING DEVICE flashes 4 times. The order of the LED flashes corresponds to the CPU(IC) on the respective P.C.B..s as shown below. If an IC is defective, the corresponding flash time is longer.<br>1. OK<br>2. CPU defective<br>NOTE: ● indicates short flash time<br>▬ indicates long flash time<br> 
</td></tr>
</table>

<table>
<tr><th>No.</th><th>PCB</th><th>TEST MODE</th><th>Procedure</th></tr>
<tr><td>3</td><td>MAIN</td><td>Wave ROM check<br>MAIN: IC25</td><td>Press and hold the two E keys shown below, and then turn on the power switch.<br>  <br>E keys</td></tr>
<tr><td></td><td></td><td colspan="2">When set to the self-diagnostic mode, the Wave ROM outputs a sine wave. The Wave ROMs correspond to the keyboard keys as shown in the diagram to the right. When a key is pressed, the corresponding sine wave sound is produced. If no sound is produced, or if the sound is distored, the Wave ROM corresponding to that key is defective.<br>The key number indicates the Wave ROM number. (1:IC25)<br><table><tr><td>KEY</td><td>C</td><td>C#</td><td>D</td><td>D#</td><td>E</td><td>F</td><td>F#</td><td>G</td><td>A</td><td>A#</td><td>B</td></tr><tr><td></td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr></table></td></tr>
<tr><td>4</td><td>CP</td><td>LED & SW check</td><td>Press and hold the two F keys shown below, and then turn on the power switch.<br>  <br>F keys</td></tr>
<tr><td></td><td></td><td colspan="2">All the LEDs turn off after lighting once. Confirm that all the LEDs light.</td></tr>
<tr><td>5</td><td>LCD</td><td>LCD Display check</td><td>Press and hold the two G keys shown below, and then turn on the power switch.<br>  <br>G keys</td></tr>
<tr><td></td><td></td><td colspan="2">All dots of the LCD screen light for 10 seconds, after which different displays appear in succession.</td></tr>
</table>

## ■ Connection between serving CHECKING DEVICE and MAIN P.C.B.



# SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE

The following changes in performance may occur in the Technics Keyboard but do not indicate trouble.

| | Phenomenon | Remedy |
|---|---|---|
| Sounds and effects | The buttons, keys, etc. malfunction. | •Turn off the **PLAY** button once, then turn it on again. If this procedure is not successful, turn off this button once. Then, while pressing the three buttons to the right of the display, (**TRANSPOSE** ∧ and ∨ , and **EXIT**) at the same time, turn the **PLAY** button on again. (Note that, in this case, all programmable settings, functions and memories return to their factory-preset status.) |
| | No sound is produced when the keys are pressed. | •The **MAIN VOLUME** is at the minimum setting. Adjust the volume with the **MAIN VOLUME** control.<br>•The volumes for the selected parts are set to the minimum levels. Use the balance buttons to set the volumes of the relevant parts to appropriate levels.<br>•The part is muted.<br>•The local control for a part performed on the keyboard is set to OFF. Set the local control to ON. |
| | Only percussive instrument sounds are produced when the keyboard is played. | •A sound in the **KEYBOARD PERC** sound group is selected. |
| | The volume is very low when the keyboard is played. | •The volume setting in the **SEQUENCER** contents is very low. Follow the INITIAL procedure to reset the settings. |
| | Some sounds cannot be selected. | •When the GENERAL MIDI status is set to on, the sounds which can be selected and operation which can be executed are limited. Turn the GENERAL MIDI status off to return the instrument to its normal operation. |
| | The sound you hear is different from the sound you selected. | •This sometimes occurs when you play back **SEQUENCER** or **COMPOSER** data which was created on a different model, or when MIDI data is received from a connected instrument. Select the desired sounds again. |
| Rhythm | The rhythm does not start. | •The **DRUMS** volume is set to the minimum level. Use the balance buttons to set the **DRUMS** volume to an appropriate level.<br>•A rhythm in memory with no stored pattern was selected. Select a different rhythm.<br>•A **SEQUENCER PLAY** button is on. when you are not playing back the **SEQUENCER** performance, turn off the **SEQUENCER PLAY** button.<br>•Clock is set to MIDI. Set CLOCK to INTERNAL.<br>•The rhythm does not work when the GENERAL MIDI mode is set to ON. Turn to GENERAL MIDI status off to return the instrument to its normal operation. |

| | Phenomenon | Remedy |
|---|---|---|
| AUTO PLAY CHORD | No sound is produced for the automatic accompaniment. | •A rhythm in **COMPOSER** memory with no stored pattern was selected. Select a different rhythm. |
| | No sound is produced for the automatic accompaniment, or only the sounds of some parts are produced. | •An **ACCOMP** part does not sound if its corresponding volume is set to the minimum level. Use the respective balance buttons to set the **ACCOMP 1, 2** and **3** volumes to appropriate levels. |
| SEQUENCER | Storage is not possible. | •The remaining memory capacity of the **SEQUNCER** is 0. Follow the SONG CLEAR or TRACK CLEAR procedure to erase the memory. |
| | Multi-track storage is not possible. | •The playback track has been selected, but the START/STOP button has not been pressed. On the recording display, the track marked with a horizontal bar in the REC row is the track which is ready for recording; a track marked with a horizontal bar in the PLAY row is a track which is ready for playback. To record one track while listening to another(playback) track, press the START/STOP button to begin playback. |
| | The playback measure indication is different from when the performance was recorded. | •The number of measures corresponds to the time signature of the rhythm selected at the start of recording. To change the rhythm in the middle of the song, record the rhythm change in the RHYTHM part. |
| COMPOSER | Storage is not possible. | •The remaining memory capacity of the **COMPOSER** is 0. |
| | Setting the time signature and number of measures is not possible. | •The time signature and number of measures cannot be changed for a pattern which is currently recorded in the **COMPOSER**. If you wish to change the time signature and/or measure data, first follow the procedure to clear the memory. |
| | The playback timing of the rhythm pattern is different from the timing with which it was recorded. | •The QUANTIZE function was on when the parttern was recorded and the timing was automatically corrected. Set the quantize level to a smaller note unit or to OFF when recording. |
| Disk Drive | The Disk Drive produces a noise during recording or playback. | •This occurs when the Disk Drive is reading a disk. It does not indicate a problem. |
| | When the procedure to load from a disk is performed, the contents of the keyboard memory are erased. | •When performing the load operation from a disk, the keyboard memory changes to that of the data loaded from the disk. If you wish to preserve a song which is stored in the keyboard memory, save it on a disk before performing the load procedure. |
| Other | Noise from a radio or TV can be heard. | •This sometime occurs when electrical equipment such as a radio or TV is used near the instrument. Try moving such electrical equipment further away from the instrument.<br>•The sound may be coming from a nearby broadcast station or amteur radio station. If the sound is bothersome, consult your dealer or service center. |
| | The cabinet becomes warm during use. | •This instrument has a built-in power source that heats the cabinet to some degree. This is not an indication of trouble. |

# ERROR DISPLAY

| Display | | Contents |
|---|---|---|
| 00 | WRONG DISK! | The data on the disk that you are using is for a different product. |
| 01 | LOAD ERROR TRY AGAIN! | An error has occurred while the disk was loading. Please try again. |
| 02 | NO DISK! | There is no disk in the Disk Drive. |
| 03 | FILE EMPTY! | The file that you tried to load is empty. |
| 04 | SAVE ERROR TRY AGAIN! | An error has occurred while the data was being saved. Please try again. |
| 05 | WRITE PROTECTED! | The disk that you are using is write protected. Please remove the write protection and try again. |
| 06 | DISK FULL! | The disk that you are using is full. Please use another disk. |
| 07 | FORMAT ERROR TRY AGAIN! | An error has occured while the disk was formatting. The disk that you are using may be faulty. Please try formatting another disk. |
| 08 | DATA IS COPY PROTECTED! | The data on this disk is copy protected. |
| 09 | ALREADY COPY PROTECTED! | The data on this disk is already copy protected. |
| 11 | SEQUNCER DATA ERROR! | There is an error in the **SEQUENCER** data. Playback is not possible. |
| 12 | MEMORY FULL! | The memory is full. No more data can be recorded. |
| 13 | CHANGE IMPOSSIBLE! | It is not possible to change the time signature of a **COMPOSER** pattern after it has been recorded. If you want to proceed, you must first clear the entire **COMPOSER** pattern. |
| 14 | TIME SIG MISMATCH! | The time signature of the pattern from which you are copying is different from the **COMPOSER** memory that you are using. Either: Change the time signature of the **COMPOSER** memory or: Copy from a pattern that has the same time signature. |
| 15 | TIME SIG ALREADY SET | The time signature has already been set. It cannot be changed. |
| 16 | TRACK EXISTS! | The specified track already exists. It is impossible to assign two tracks to that part. |
| 17 | FILE TOO LONG! | The song is too long to be saved as an SMF file. |
| 18 | SMF LOAD ERROR! | The SMF file that you tried to load exceeds the memory capacity of this instrument and cannot be loaded. The destination **SEQUENCER** memory has been cleared. |
| 19 | BULK DUMP SEND ERROR! | An error occurred during system exclusive transmission. The data was not transmitted successfully. Please try again. |
| 20 | BULK DUMP RECV ERROR! | An error occurred during system exclusive data reception. The data was not received successfully. Please try again. |
| 21 | BULK DUMP ID CODE ERR! | The Identication (ID) code of the system exclusive data received by this instrument is for a different product. |

| Display | | Contents |
|---|---|---|
| 22 | "ALL" OPTION ONLY AVAIL | To load data which was saved on an older model Techincs instrument, set the load option to "ALL". |
| 23 | NO SEQUENCER DATA! | There is no data in the **SEQUENCER**. |
| 24 | SMF CONVERT ERROR! | An error occurred in the SMF conversion. |
| 25 | NOT STANDARD MIDI FILE! | This disk is not in the Standard MIDI File data format. |
| 26 | SMF CONVERT ERROR! | SMF conversion is possible only for files with a time base (PPQ resolution) of 24/48/96/192/288/384. |
| 27 | SMF FORMAT ERROR! | FORMAT 2,3,4...SMF data cannot be used. |
| 28 | RHYTHM & CHORD ONLY! | Step record can be activated only for tracks to which the RHYTHM or CHORD part has been assigned. |
| 29 | SELECT A PRESET PTN! | A **COMPOSER** rhythm cannot be selected for the **SOUND ARRANGER**. Please select a preset rhythm. |
| 30 | SELECT A USER BANK! | Please select Bank "13 User Memory" to store in the **MANUAL SEQUENCE PADS**. |
| 31 | TRACK ASSIGN MISMATCH! | Special tracks such as CHORD/APC, RHYTHM and CONTROL exist in the song from which you are copying and are incompatible with the destination song because it is in the GM mode. |
| 32 | MEAS/T.SIG MISMATCH! | The **COMPOSER** pattern you have chosen has a different time signature or number of measures from the other patterns in this **COMPOSER CHORD MAP**. All of the **COMPOSER** patterns used in a **COMPOSER CHORD MAP** must have the same time singnature and number of measures. |
| 33 | NOT ENOUGH AVAIL MEMORY | The song that you have tried to load exceeds the this instrument's available memory and cannot be loaded. The selected **SEQUENCER** song memory has been cleared. Please clear existing songs in the instrument's memory using SONG CLEAR to make more memory available, and try again. |
| 34 | THIS FILE IS SMF FORMAT! | This is an SMF FORMAT 1 file. Direct Play and Sequncer Medley are not available for this file. |
| 35 | RHYTHM DATA ERROR! | There is an error in the rhythm data. Playback is not possible. |
| 36 | MSP DATA ERROR! | There is an error in the **MANUAL SEQUENCER PADS** data. Playback is not possible. |
| | WARNING! LOW BATTERIES! | The remaining battery power is very low. Replace all the batteries with new ones immediately. |

# PRECAUTIONS BEFORE SERVICING

## ■ Precautions for measuring of the output waveforms.

1. The waveform was measured with a "National Digital Storage Oscilloscope YP-5730A". Therefore the waveforms of musical tone signals shown may differ somewhat due to the difference in the timing of triggering.
2. Since the 1/10 test probe is used, the indicated voltage value on the bottom part of each waveform photo is 1/10 of the actual value (e.g. 0.2 V/cm should be 2.0 V/cm).
3. To measure the waveforms, first set this unit to the self-diagnostic mode (refer to page I -12, No.3). The Wave ROM output will then be output as a sine wave to facilitate the servicing check.

## ■ Important safety notice:

Components identified by a ⚠ mark have special characteristics impotant for safety.
When replacing any of these components, use only manufacture's specified parts.

## ■ Symbolic Marks

The symbolic marks for resistors and capacitors which used in this circuits are classified as following TABLE-1 and TABLE-2.

1. RESISTORS
   - •Resistors without symbolic mark are FIXED CARBON FILM RESISTORS(ERD-type).
   - •All resistors are 1/4WATT, ± 5%TOLERANCE unless otherwise designated in schematic diagrams.

(TABLE-1)

| SYMBOL | SPECIFICATION | SYMBOL | SPECIFICATION |
|---|---|---|---|
| Ⓕ | Fixed Carbon Film Resistors "FLAME-PROOF"(ERD—F—type) | Ⓕ | Fixed Metal Film Resistors "FLAME-PROOF"(ERX—type) |
| Ⓕ | Fixed Wire Wound Resistors "FLAME-PROOF"(ERF—type) | [F] | Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF"(ERQ—type) |
| Ⓕ | Fixed Metal Oxide Film Resistors "FLAME-PROOF"(ERG—type) | [F] | Fuse Type Fixed Carbon Film Resistors "FLAME-PROOF"(ERD2FC—type) |
| Ⓖ | Fixed Metal Film Resistors (Precision and High Stability) (ERO—type) | | |

2. CAPACITORS
   - •Capacitors without symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type, ± 10%Tolerance)
   - •Polarized capacitors without symbolic mark are Aluminum Electrolytic Capapcitors. (ECEA-type, ± 20%Tolerance)

(TABLE-2)

| SYMBOL | SPECIFICATION | SPECIFICATION |
|---|---|---|
| Ⓝ | Non-Polarized Electrolytic Capacitors | ECEA_KN_type |
| Ⓨ | Non-Polarized Electrolytic(for Network system) | ECEA_Y_type |
| Ⓣ | Tantalum Solid Electrolytic Capacitors | ECS_type |
| TF | Metalized Plastic Film Capacitors(TF Series) | ECQV_type |
| ○ | Temperature Compensating Ceramic Capacitors | ECC_type |
| | High-Dielectric Constant Ceramic Capacitors | ECK_type<br>ECR_type |
| | Axial Lead Ceramic Capacitors | ECB_type |
| | Metalized Polyester Film Capacitors for Across the Line | ECQ_EW_type |
| | Aluminum Electrolytic Capacitors for Smoothing Circuit | ECES_type |
| | Multilayer Ceramic Chip Capacitors | ECUV_type |

# MIDI IMPLEMENTATION CHART

**Keyboard** **(Transmitted)**

| Function | | RIGHT1,2,LEFT, PART4~15 | PART16 | ACMP1 | ACMP2,3 | BASS | DRUMS | CHORD | CONTROL | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| **Basic** | Default | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | memorized |
| **Channel** | Changed | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | |
| | Default | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | OMNI OFF, POLY MODE |
| **Mode** | Messages | × | × | × | × | × | × | × | × | |
| | Altered | – | – | – | – | – | – | – | – | |
| **Note** | | 0-119 | 0-119 | 0-119 | 0-119 | 0-119 | 0-119 | 0-119 | – | Changes depending on the position of the transpose control, octave shift, and drums type. |
| **Number** | True voice | – | – | – | – | – | – | – | – | |
| **Velocity** | Note ON | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – | |
| | Note OFF | × | × | × | × | × | × | × | – | |
| **After** | Key's | × | × | × | × | × | × | × | – | |
| **Touch** | Ch's | ○× * | × | × | × | × | × | × | – | |
| **Pitch Bend** | | ○× * | × | ○× * | ○× * | ○× * | × | ○× * | × | |
| **Control Change** | 0,32 | ○× * | ○× * | ○× * | ○× * | ○× * | ○× * | ○× * | × | bank select MSB, LSB |
| | 1 | ○× * | × | ○× * | ○× * | ○× * | × | ○× * | × | modulation |
| | 6,38 | ○× * | × | × | × | × | × | × | × | data entry MSB, LSB |
| | 7 | ○× * | ○× * | ○× * | ○× * | ○× * | ○× * | ○× * | × | volume |
| | 10 | ○× * | × | ○× * | ○× * | ○× * | × | × | × | panpot |
| | 11 | ○× * | ○× * | ○× * | ○× * | ○× * | ○× * | × | ○× * | expression |
| | 64 | ○× * | × | ○× * | ○× * | ○× * | × | × | × | sustain |
| | 80 | × | × | ○× * | × | × | × | × | × | auto play chord |
| | 82 | × | × | × | × | × | ○× * | × | × | intro, fill in, ending |
| | 91 | ○× * | ○× * | ○× * | ○× * | ○× * | ○× * | ○× * | ○× * | reverb |
| | 93 | ○× * | ○× * | × | × | × | × | × | × | DSP effect/Chorus |
| | 94 | ○× * | × | ○× * | ○× * | ○× * | × | ○× * | × | digital effect |
| | 100,101 | ○× * | × | × | × | × | × | × | × | RPN LSB, MSB |
| | 120 | ○ | ○ | × | × | × | × | × | × | all sound off |
| | 121 | ○× * | ○× * | × | × | × | × | × | × | reset all controllers |
| **Prog Change** | | ○× * | ○× * | ○× * | ○× * | ○× * | ○× * | ○× * | × | Changes depending on program change mode and prog.cng to p.mem. |
| | True# | – | – | – | – | – | – | – | – | |
| **System exclusive** | | ○ | | | | | | | | |
| **System common** | Song Pos | ○× * | | | | | | | | |
| | Song Sel | ○× *(0-19) | | | | | | | | |
| | Tune | × | | | | | | | | |
| **System Real Time** | Clock | ○ | | | | | | | | |
| | Commands | ○× * | | | | | | | | start/stop,continue |
| **Aux Messages** | Local ON/OFF | × | × | × | × | × | × | × | – | |
| | All notes OFF | × | × | × | × | × | × | × | – | |
| | Active Sense | ○ | | | | | | | | |
| | Reset | × | | | | | | | | |
| **Notes** | | ○× *••••••••••••Whether or not the data for each these items is transmitted can be set. | | | | | | | | |

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO ○ : Yes

Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO × : No

## Keyboard

**(Recognized)**

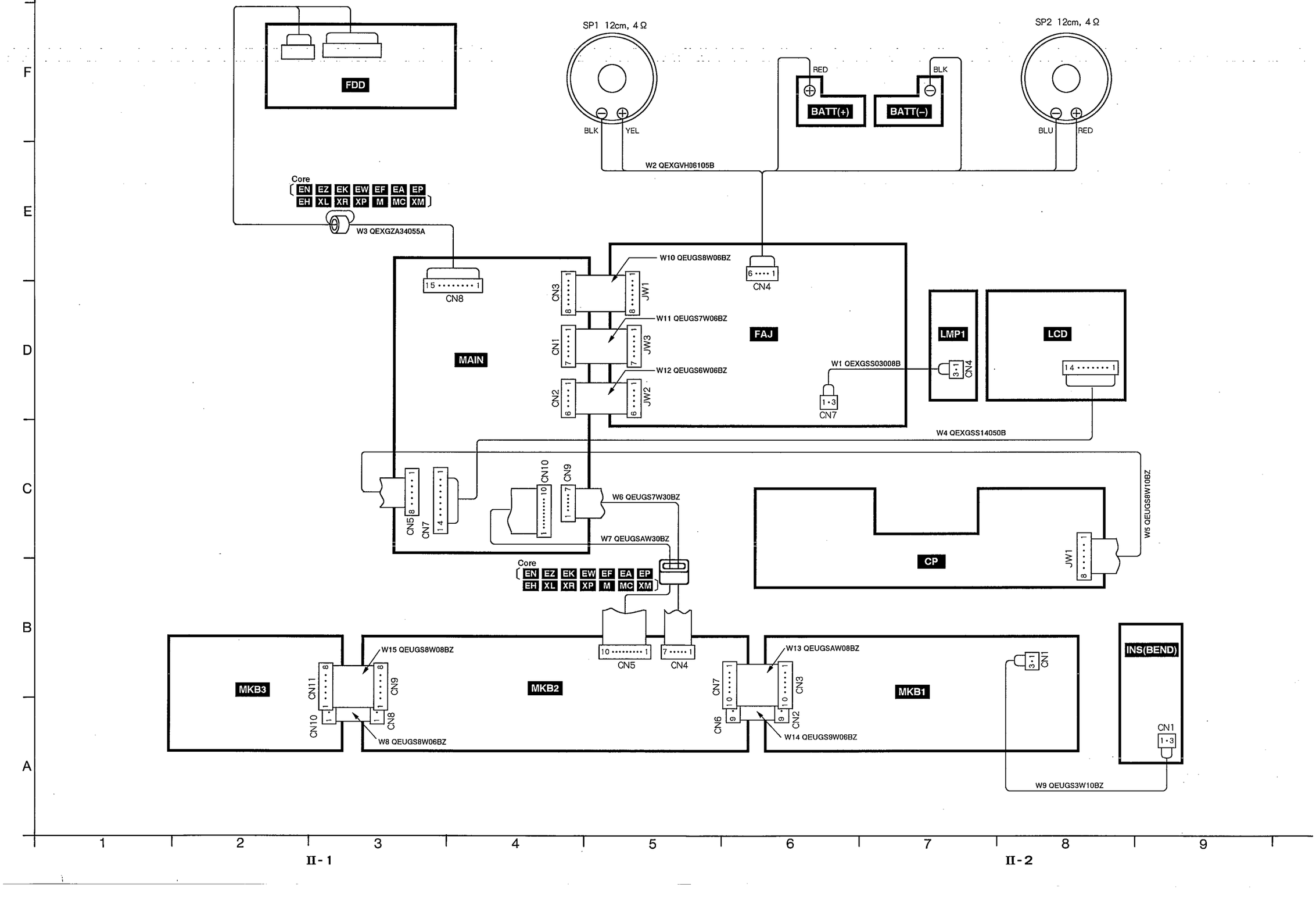
| Function | | RIGHT1,2,LEFT, PART4~15 | PART16 | ACMP1 | ACMP2,3 | BASS | DRUMS | CHORD | CONTROL | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| **Basic** | Default | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | memorized |
| **Channel** | Changed | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | 1-16 | |
| | Default | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | OMNI OFF, POLY MODE |
| **Mode** | Messages | × | × | × | × | × | × | × | × | |
| | Altered | – | – | – | – | – | – | – | – | |
| **Note** | | 0-127 | 0-127 | 0-127 | 0-127 | 0-127 | 0-127 | 0-127 | – | Changes depending on the position of the transpose control, octave shift, and drums type. |
| **Number** | True voice | 0-127 | 0-127 | 0-127 | 0-127 | 0-127 | 0-127 | 0-127 | – | |
| **Velocity** | Note ON | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – | |
| | Note OFF | × | × | × | × | × | × | × | – | |
| **After** | Key's | × | × | × | × | × | × | × | – | |
| **Touch** | Ch's | ○×* | × | × | × | × | × | × | – | |
| **Pitch Bend** | | ○×* | × | ○×* | ○×* | ○×* | × | ○×* | × | |
| **Control Change** | 0,32 | ○×* | ○×* | ○×* | ○×* | ○×* | ○×* | ○×* | × | bank select MSB, LSB |
| | 1 | ○×* | × | ○×* | ○×* | ○×* | × | ○×* | × | modulation |
| | 6,38 | ○×* | × | × | × | × | × | × | × | data entry MSB, LSB |
| | 7 | ○×* | ○×* | ○×* | ○×* | ○×* | ○×* | ○×* | × | volume |
| | 10 | ○×* | × | ○×* | ○×* | ○×* | × | × | × | panpot |
| | 11 | ○×* | ○×* | ○×* | ○×* | ○×* | ○×* | × | ○×* | expression |
| | 64 | ○×* | × | ○×* | ○×* | ○×* | × | × | × | sustain |
| | 80 | × | × | ○×* | × | × | × | × | × | auto play chord |
| | 82 | × | × | × | × | × | ○×* | × | × | intro, fill in, ending |
| | 91 | ○×* | ○×* | ○×* | ○×* | ○×* | ○×* | ○×* | ○×* | reverb |
| | 93 | ○×* | ○×* | × | × | × | × | × | × | DSP effect/Chorus |
| | 94 | ○×* | × | ○×* | ○×* | ○×* | × | ○×* | × | digital effect |
| | 100,101 | ○×* | × | × | × | × | × | × | × | RPN LSB, MSB |
| | 120 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | × | all sound off |
| | 121 | ○×* | ○×* | ○×* | ○×* | ○×* | ○×* | ○×* | × | reset all controllers |
| **Prog Change** | True# | ○×*<br>0-127 | ○×*<br>0-127 | ○×*<br>0-127 | ○×*<br>0-127 | ○×*<br>0-127 | ○×*<br>0-127 | ○×*<br>0-127 | ×<br>– | Changes depending on program change mode and prog.cng to p.mem. |
| **System exclusive** | | ○ | | | | | | | | |
| **System common** | Song Pos | ○×* | | | | | | | | |
| | Song Sel | ○×*(0-19) | | | | | | | | |
| | Tune | × | | | | | | | | |
| **System Real Time** | Clock | ○ | | | | | | | | |
| | Commands | ○×* | | | | | | | | start/stop,continue |
| **Aux Messages** | Local ON/OFF | × | × | × | × | × | × | × | – | |
| | All notes OFF | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – | |
| | Active Sense | ○ | | | | | | | | |
| | Reset | × | | | | | | | | |
| **Notes** | | ○×*••••••••••••Whether or not the data for each these items is transmitted can be set. | | | | | | | | |

Mode 1 : OMNI ON, POLY  Mode 2 : OMNI ON, MONO  ○ : Yes

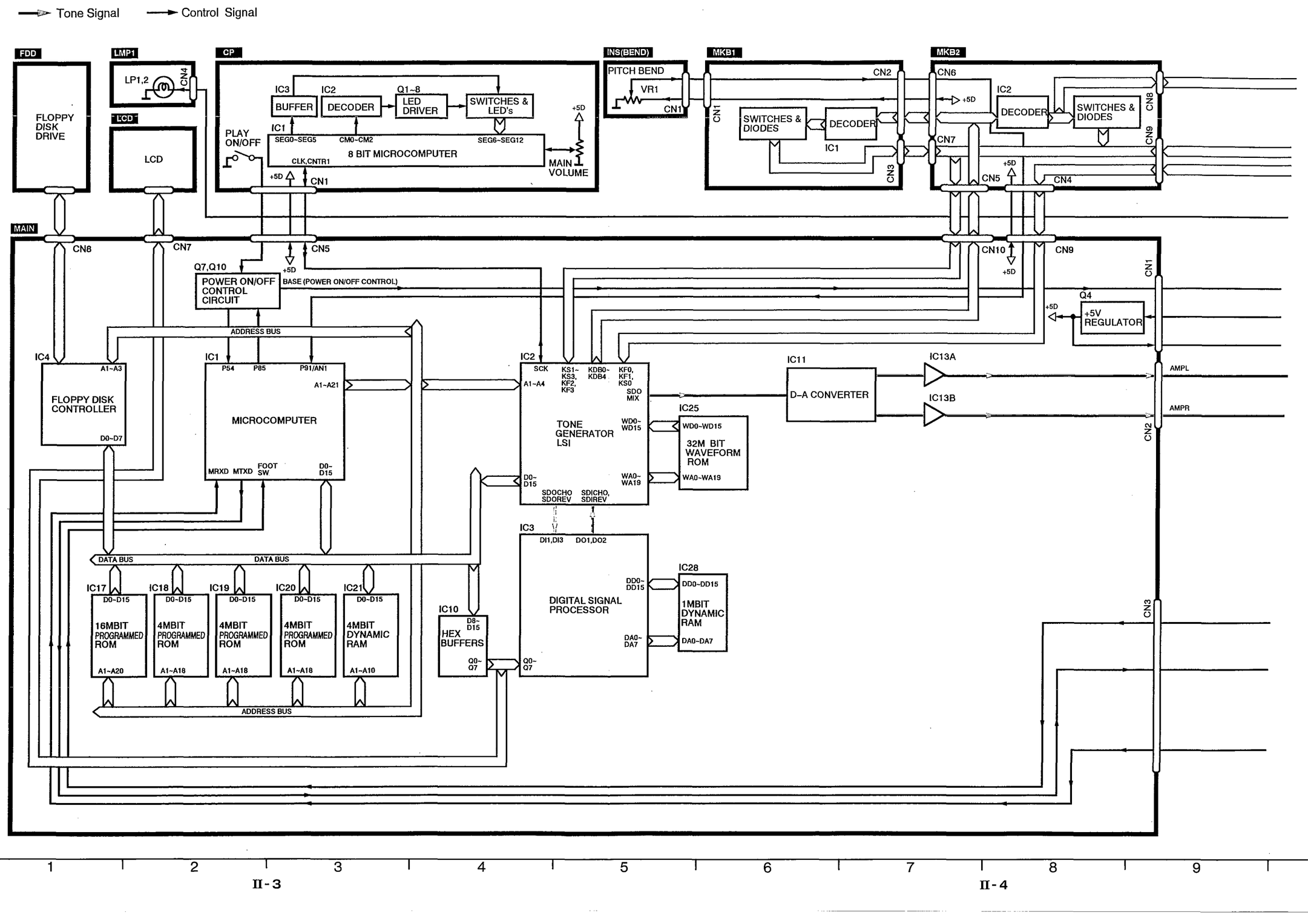
Mode 3 : OMNI OFF, POLY  Mode 4 : OMNI OFF, MONO  × : No

# MEMO

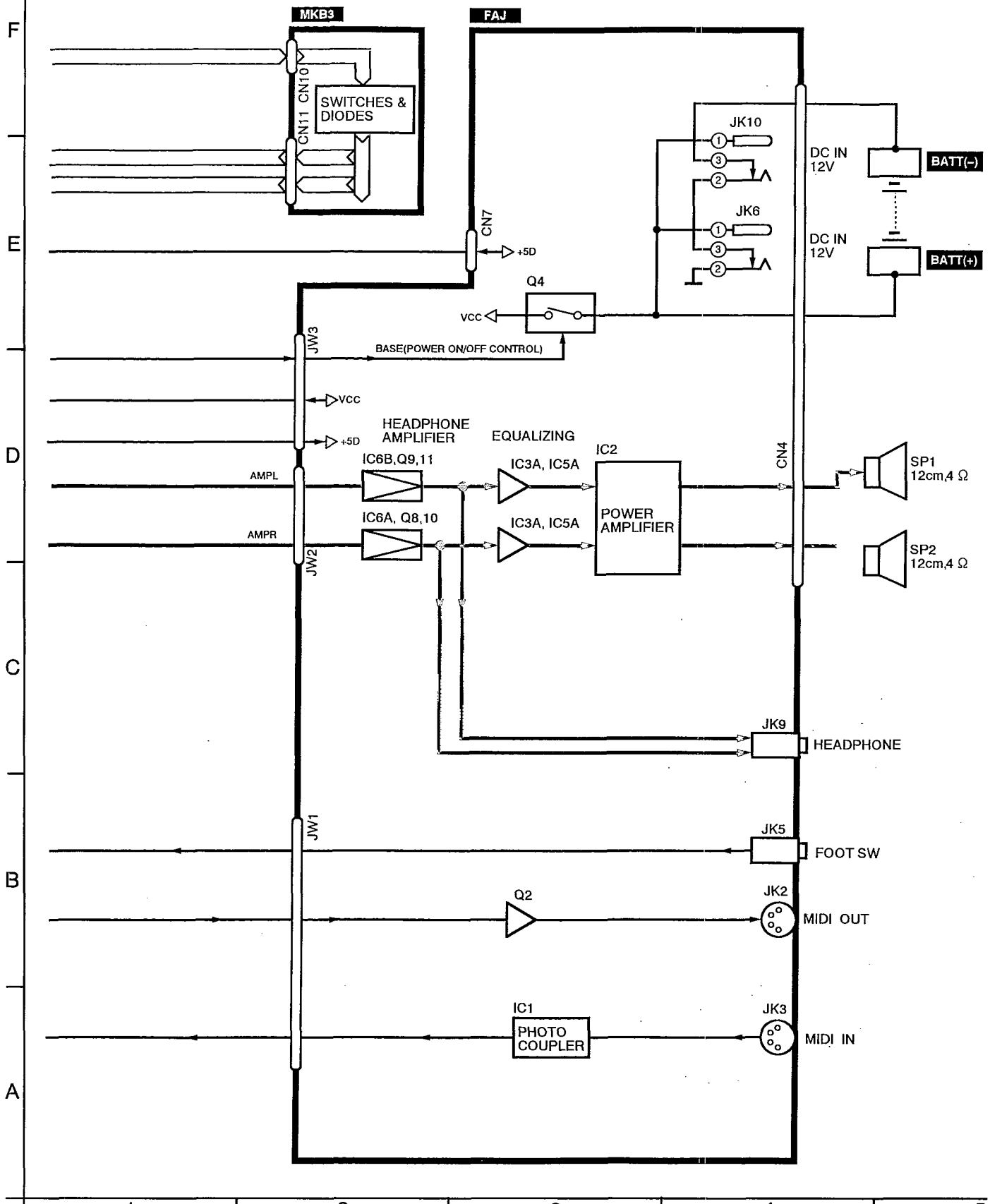
# WIRING CONNECTION Diagram



# BLOCK (A) Diagram



# BLOCK (B) Diagram



## WAVEFORM OF MAIN

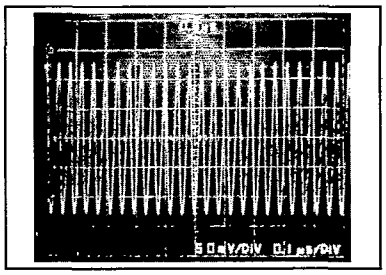
### ■ Measuring Conditions

Check Point ❺

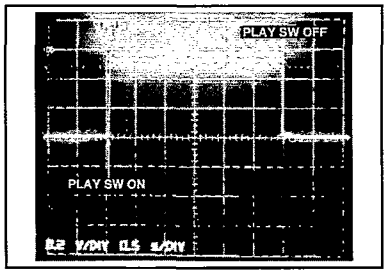
Set to the self-diagnostic mode followings.

- While pressing E3 and E4 keys simultaneously, turn on the PLAY switch.
- Number pad..... NO. 5 (SIN WAVE 10dB DOWN)
- Key ..... C3
- Main Volume ..... MAX

❶

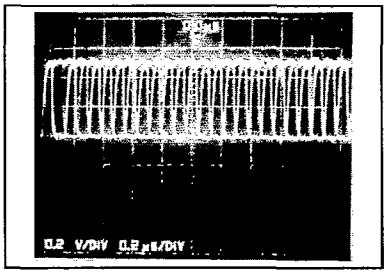


❷ 5MI

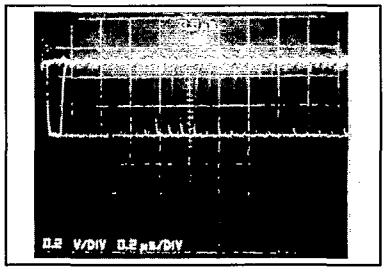



- PLAY SW..... ON → OFF

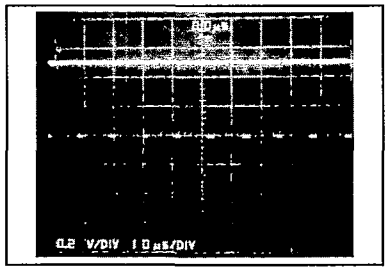
❸ $\overline{RD}$



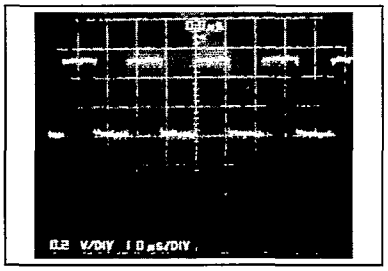
❹ $\overline{WR}$



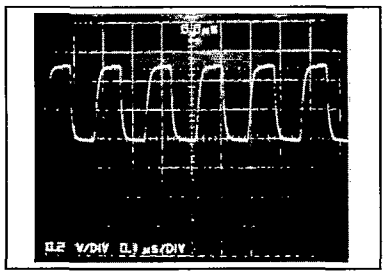
❺



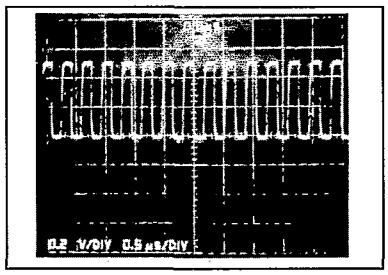
❻



❼



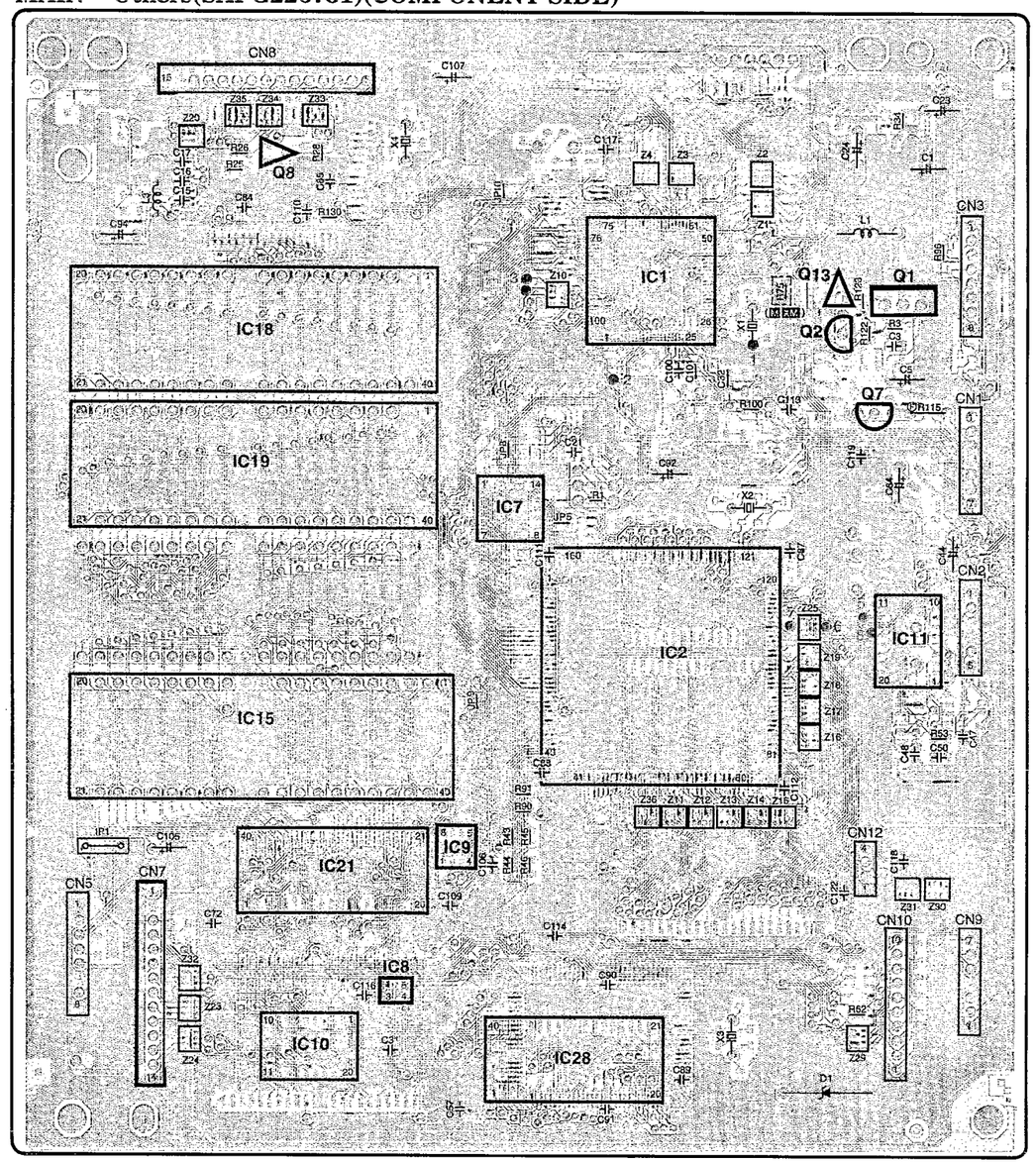
❽



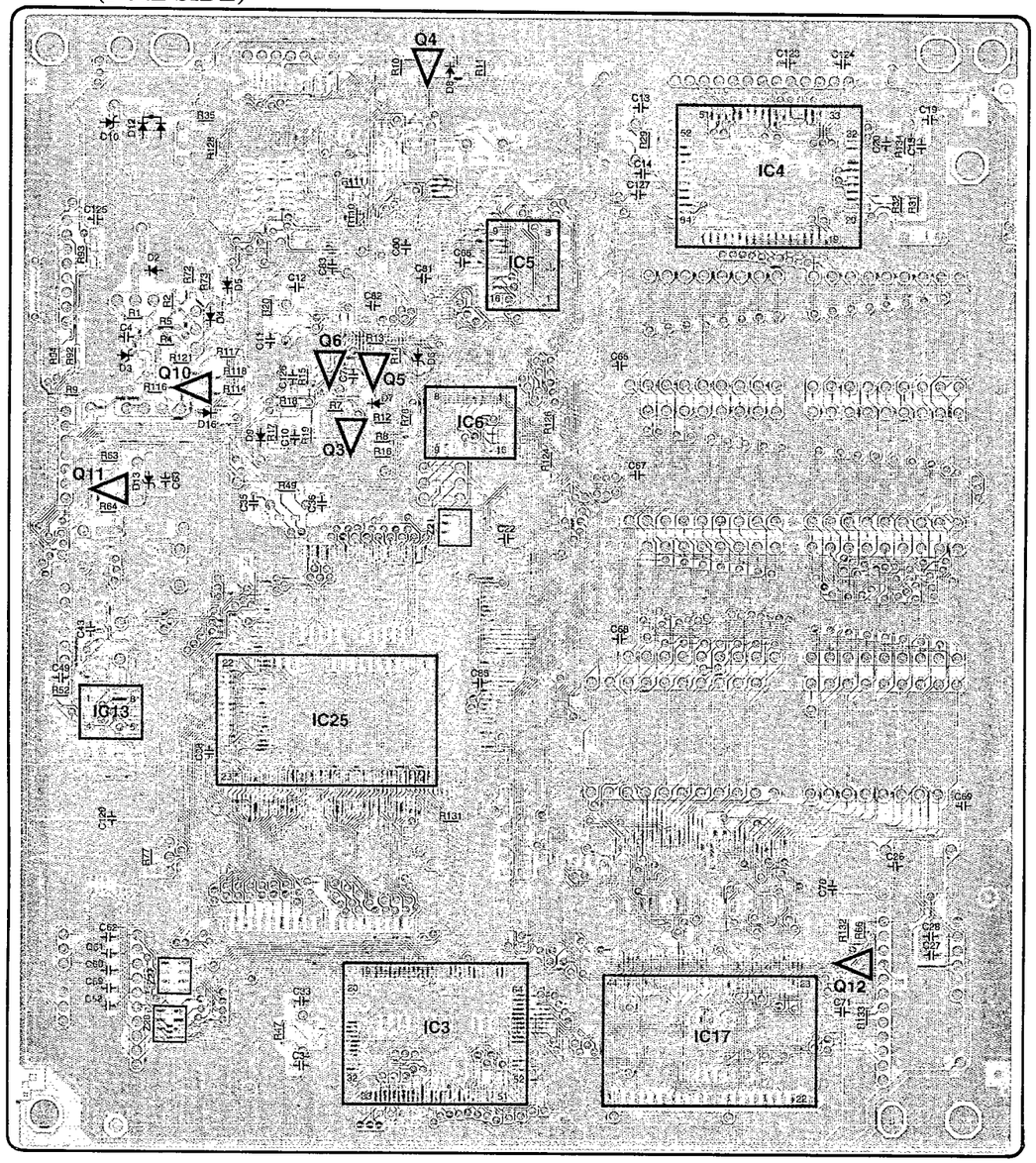
# MAIN P.C. Board

M XM (SXPG226741)

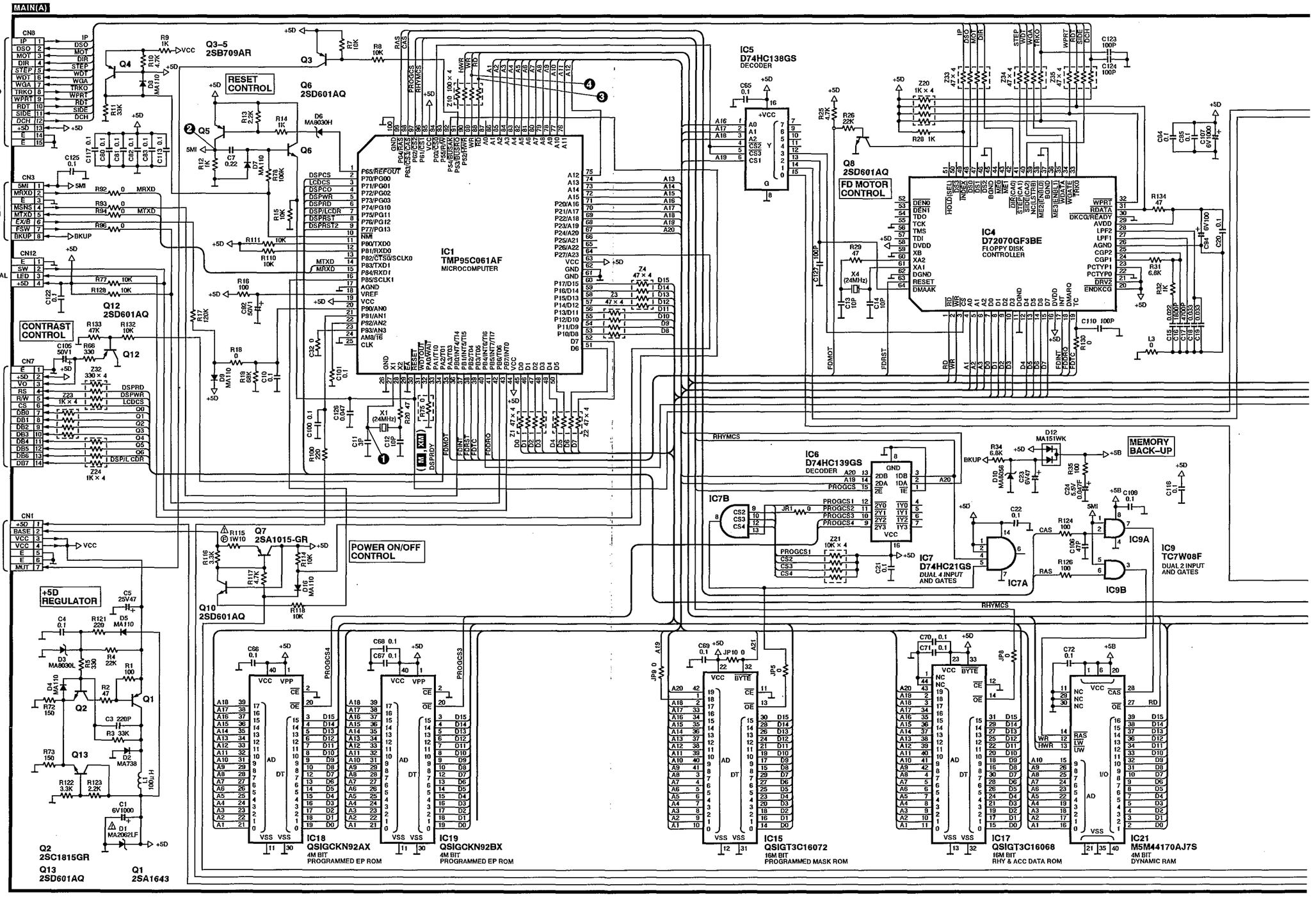
MAIN Others(SXPG226731)(COMPONENT SIDE)



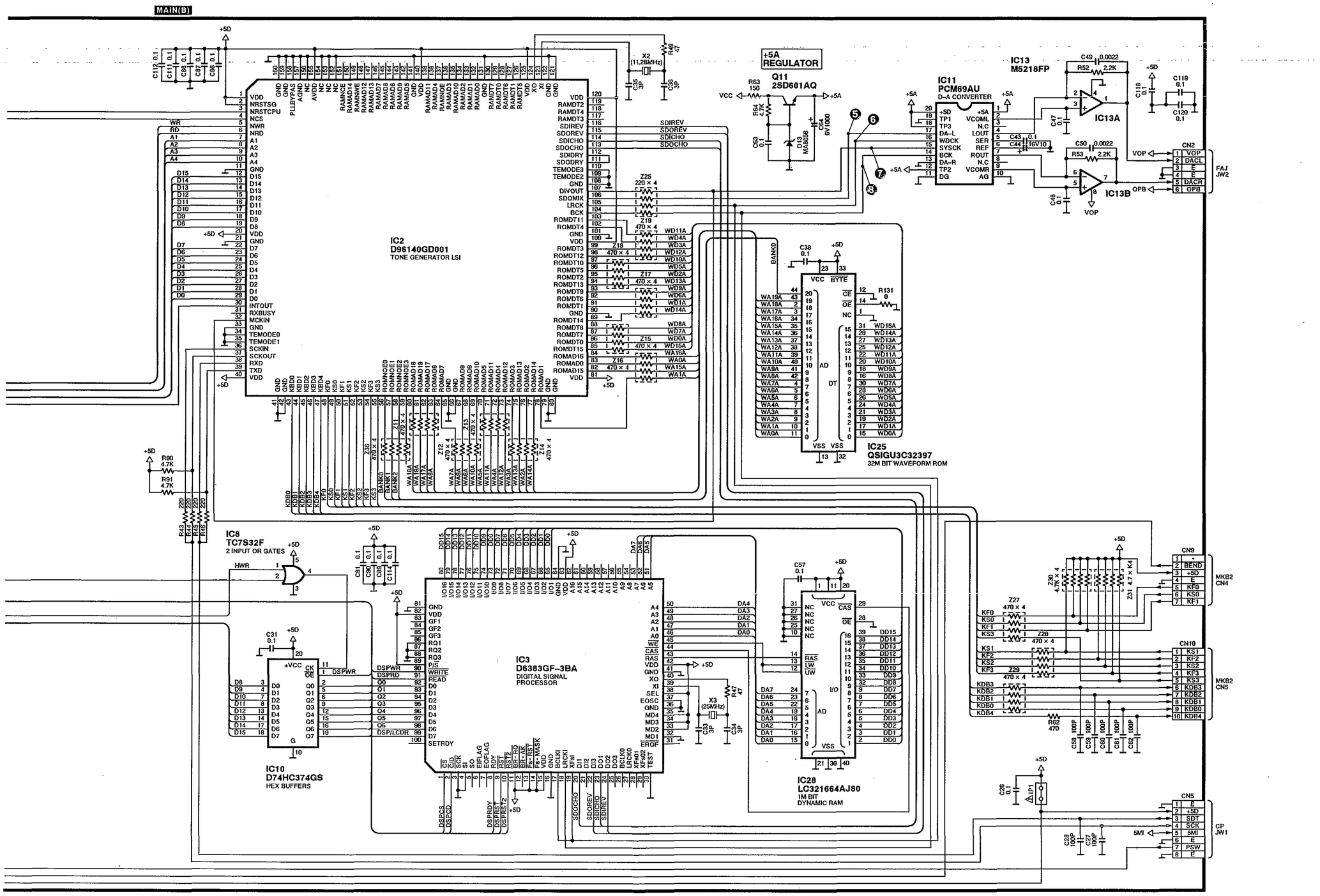

MAIN (FOIL SIDE)



# MAIN (A) P.C. Diagram



# MAIN (B) P.C. Diagram



# FAJ/LAMP 1/BATT +/− P.C. Board

## WAVEFORM OF FAJ

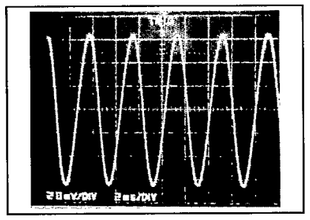
### ■ Measuring Conditions

Check Point ❶, ❷, +L OUT, −L OUT, +R OUT, −R OUT

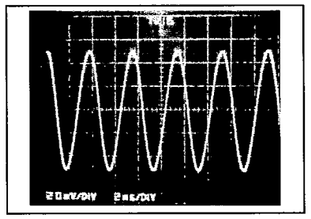
Set to the self-diagnostic mode followings.

- While pressing E3 and E4 keys simultaneously, turn on the PLAY switch.
- Number pad..... NO. 5 (SIN WAVE 10dB DOWN)
- Key ..... C3
- Main Volume ..... MAX

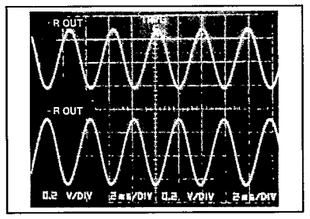
❶



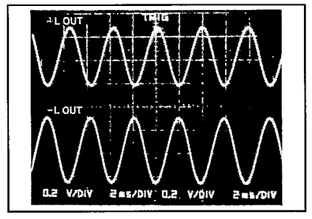
❷



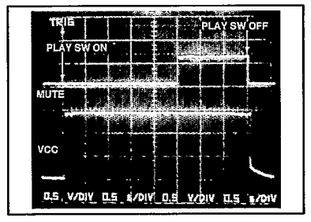
+R OUT, −R OUT




+L OUT, −L OUT

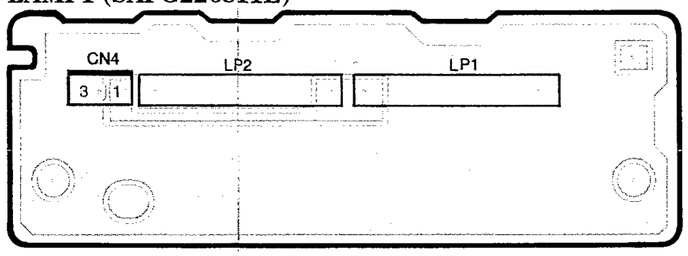



MUTE, VCC

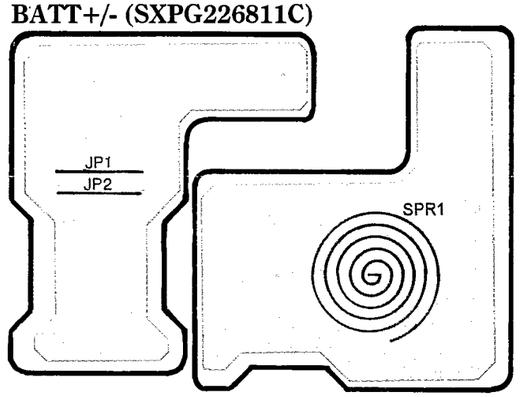



● PLAY SW..... ON ↔ OFF

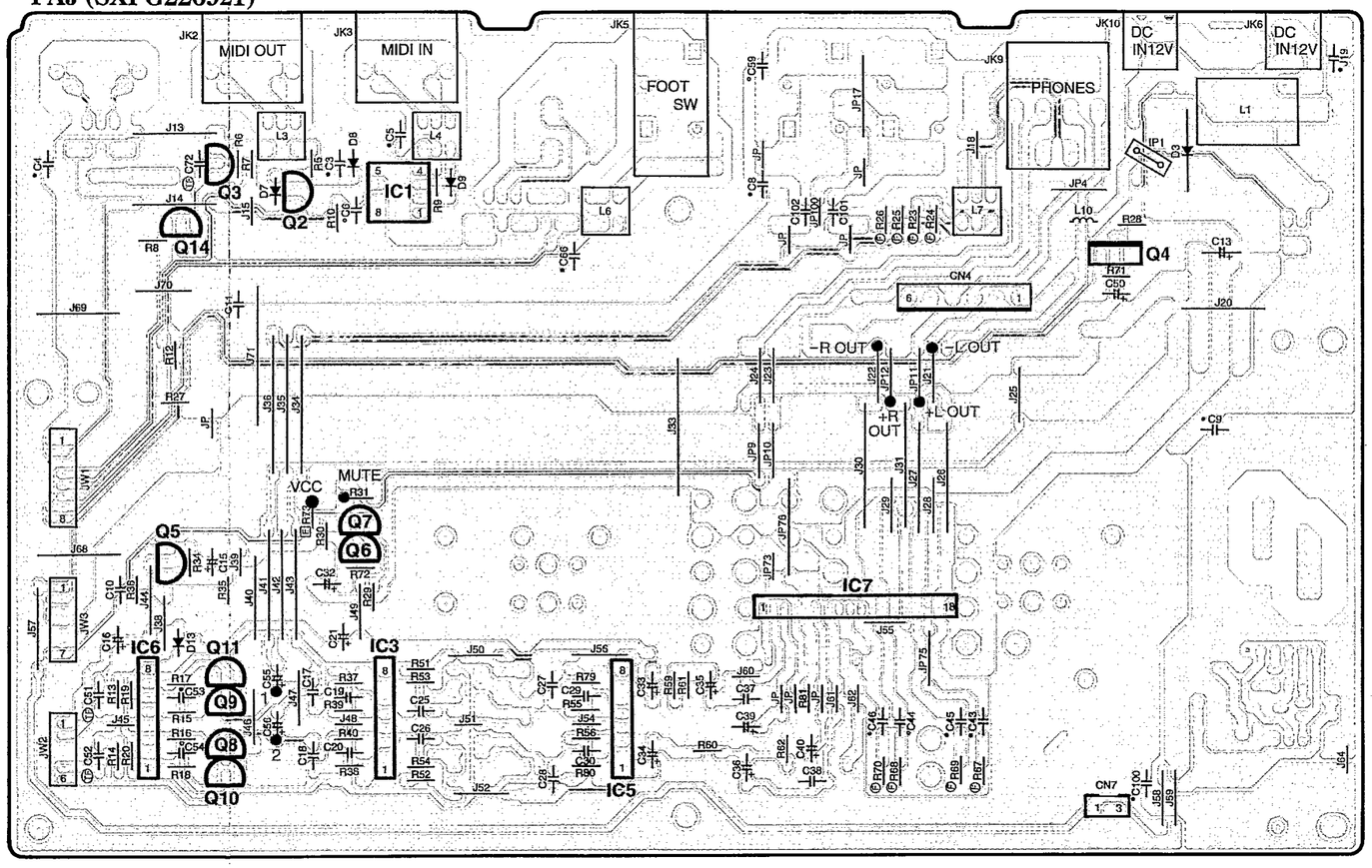
## LAMP1 (SXPG226811E)



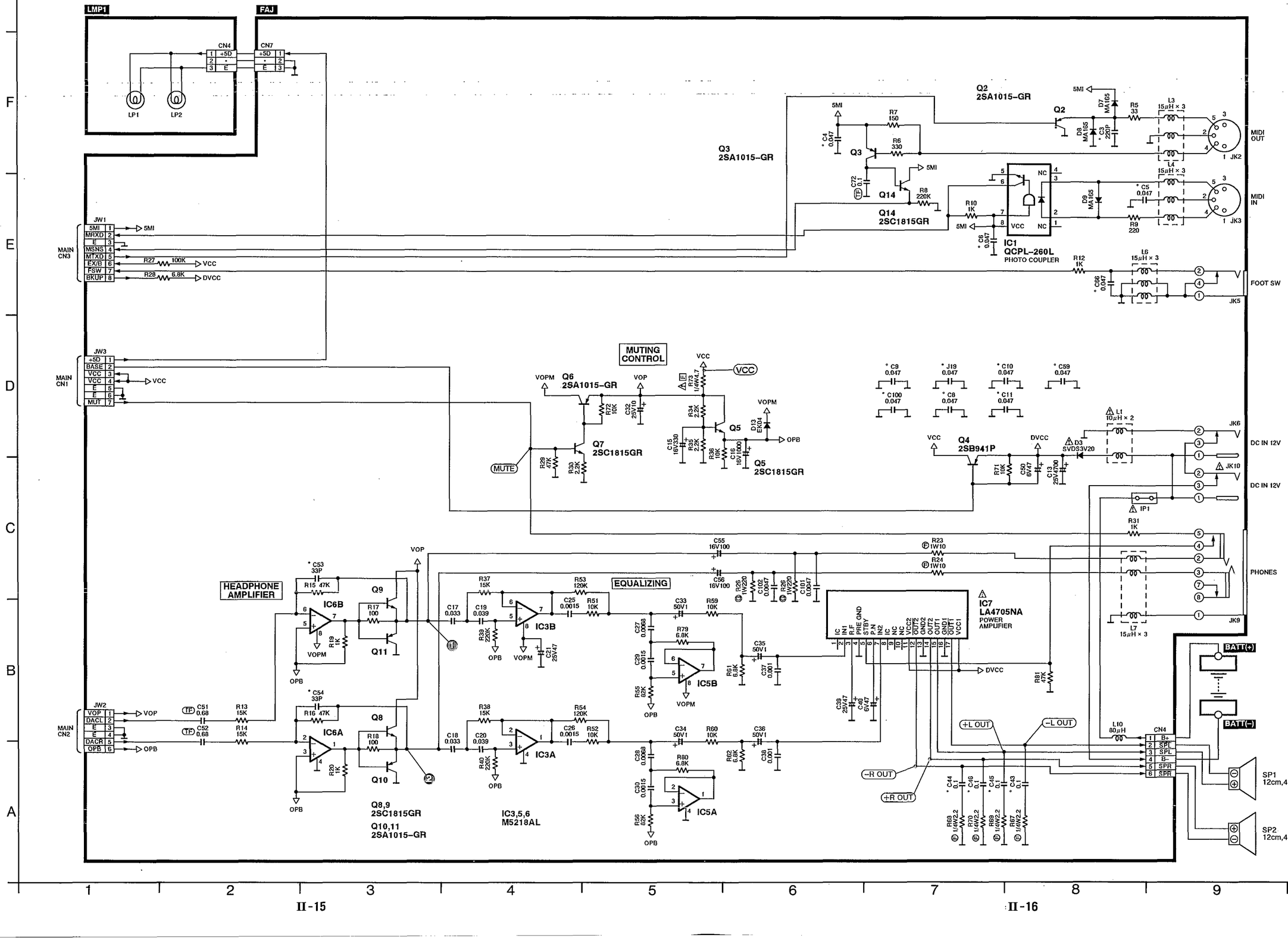

## BATT+/- (SXPG226811C)




## FAJ (SXPG226921)

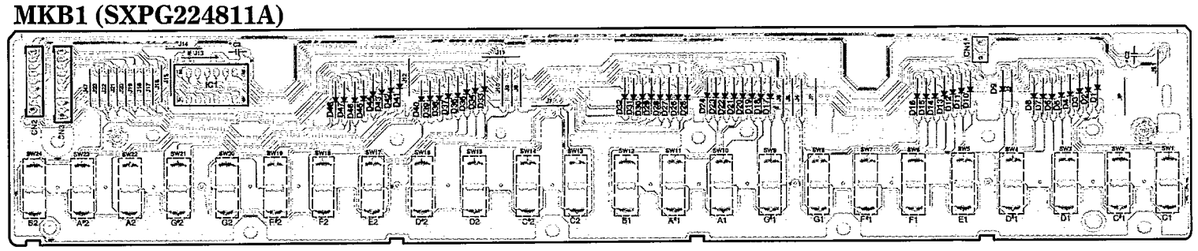


# FAJ/LAMP 1/BATT +/– P.C. Diagram

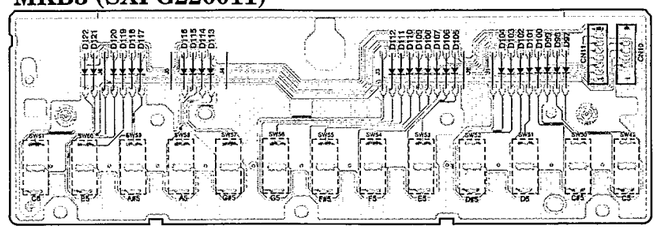


# CP/MKB1/2/3/INS (BEND) P.C. Board

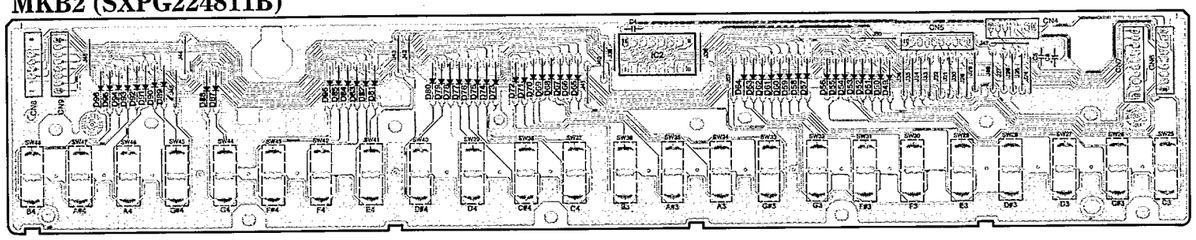
## MKB1 (SXPG224811A)



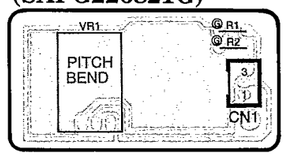
## MKB3 (SXPG220011)



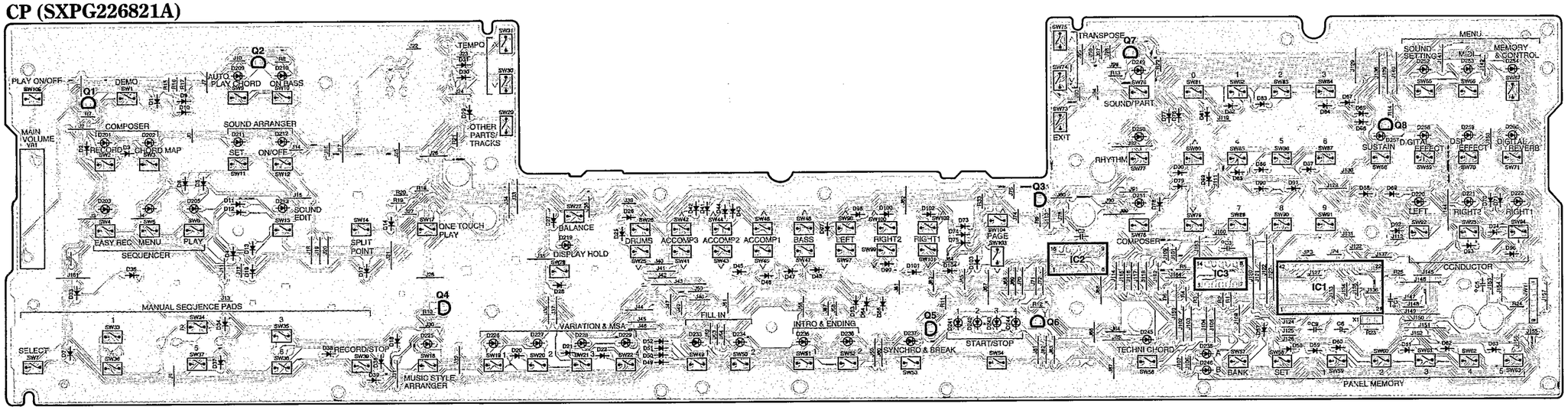
## MKB2 (SXPG224811B)



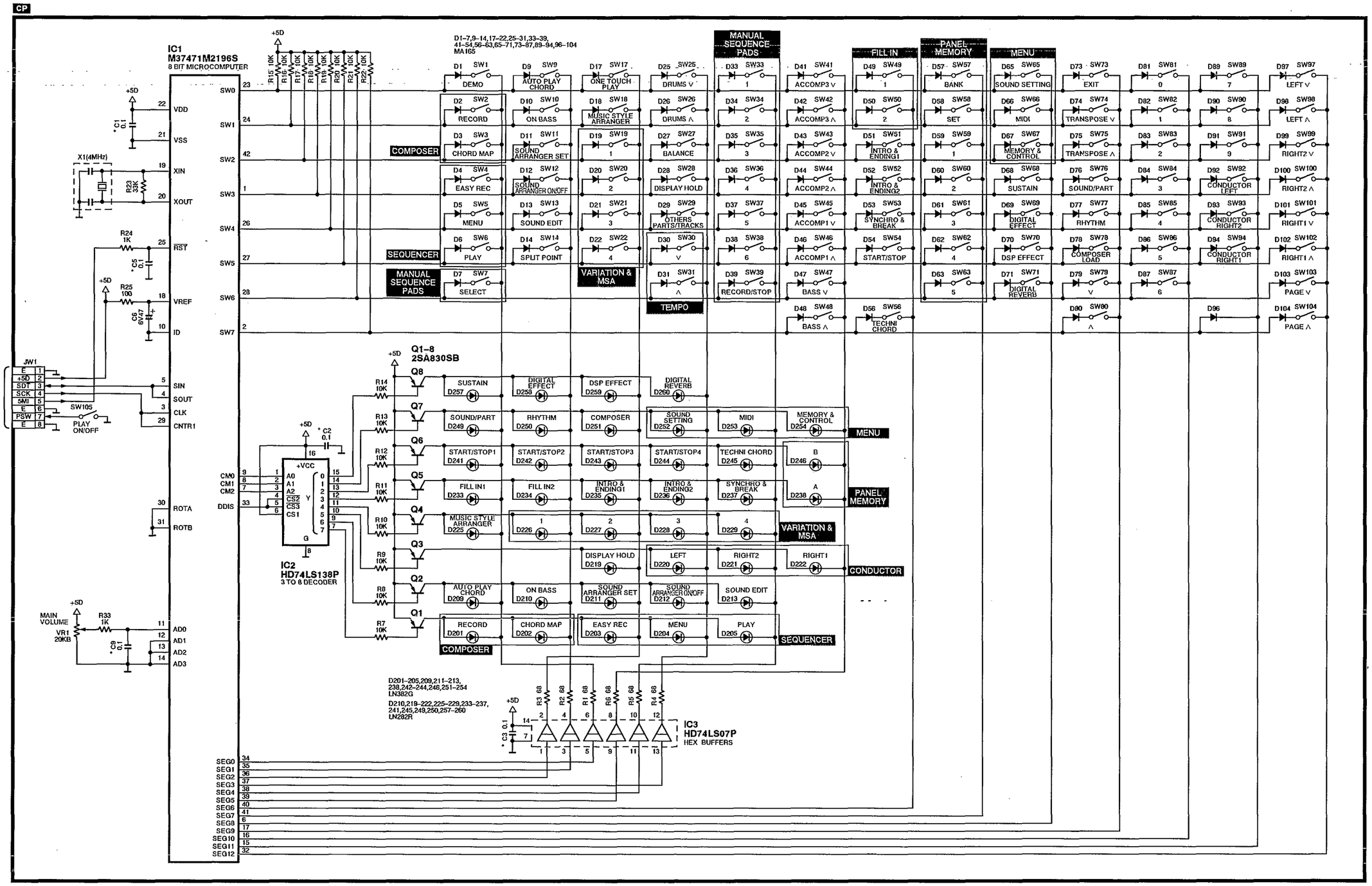
## INS(BEND) (SXPG226821G)



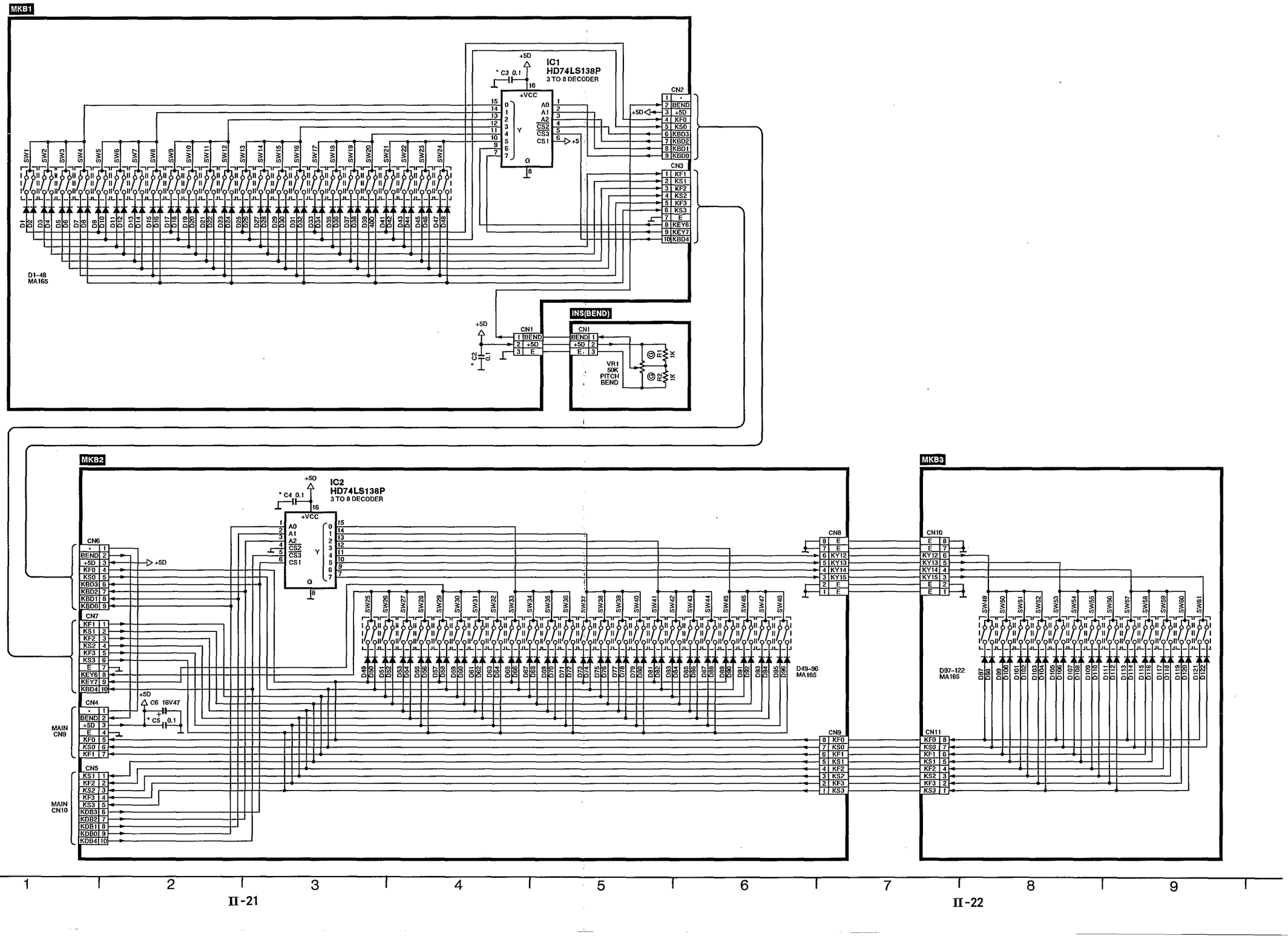

## CP (SXPG226821A)



# CP P.C. Diagram



# MKB1/2/3/INS (BEND) P.C. Diagram



# REPLACEMENT PARTS LIST

**Notes:**

1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retension period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.
4. ○ mark are new parts.
5. For part No. with area mark, check the area when placing an order.

## ■PRINTED CIRCUIT BOARD

| | RTL | Area | Part No. | Description | P/S |
|---|---|---|---|---|---|
| ○ | RTL | EN MC EZ EK EW EF EA EP EH X XL XR XS XD XT XP | SXPG226731 | MAIN | 1 |
| ○ | RTL | M XM | SXPG226741 | MAIN | 1 |
| ○ | RTL | | SXPG226821A | CP | 1 |
| ○ | RTL | | SXPG226921 | FAJ | 1 |
| ○ | RTL | | SXPG226811E | LAMP1 | 1 |
| ○ | RTL | | SXPG226811C | BATT+/− | 1 |
| S | RTL | | SXPG224811A | MKB1 | 1 |
| | RTL | | SXPG224811B | MKB2 | 1 |
| | RTL | | SXPG220011 | MKB3 | 1 |
| ○ | RTL | | SXPG226821G | INS (BEND) | 1 |
| ○ | RTL | | QSLG021AA | LCD | 1 |

## MAIN MAIN CIRCUIT

| | Ref. No. | Part No. | Description | P/S |
|---|---|---|---|---|
| | **INTEGRATED CIRCUITS** | | | |
| | IC1 | TMP95C061AF | IC, 16 BIT MICROCONTROLLER | 1 |
| | IC2 | D96140GD001 | IC, 16 BIT MICROCONTROLLER | 1 |
| | IC3 | D6383GF-3BA | IC, MICROCONTROLER, 16 BIT | 1 |
| | IC4 | D72070GF3BE | IC, 8 BIT MICROCONTROLLER | 1 |
| | IC5 | D74HC138GS | IC, CMOS LOGIC | 1 |
| | IC6 | D74HC139GS | IC, CMOS LOGIC | 1 |
| | IC7 | D74HC21GS | IC, CMOS LOGIC | 1 |
| | IC8 | TC7S32F | 2 INPUT OR GATE | 1 |
| | IC9 | TC7W08F | DUAL 2-INPUT AND GATES | 1 |
| | IC10 | D74HC374GS | IC, CMOS LOGIC | 1 |
| | IC11 | PCM69AU | D-A CONVERTER | 1 |
| | IC13 | M5218AFP | OPERATIONAL AMPLIFIER | 1 |
| ○ | IC15 | QSIGT3C16072 | IC, 16M MASK ROM | 1 |
| ○ | IC17 | QSIGT3C16068 | IC, 16M MASK ROM | 1 |
| ○ | IC18 | QSIGCKN92AX | IC, 4M EP ROM | 1 |
| | IC18-1 | HN27C4096G10 | (BLANK ROM) | 1 |
| ○ | IC19 | QSIGCKN92BX | IC, 4M EP ROM | 1 |
| | IC19-1 | HN27C4096G10 | (BLANK ROM) | 1 |
| | IC21 | M5M44170AJ7S | IC, D RAM 4M BIT | 1 |
| ○ | IC25 | QSIGU3C32397 | IC, 32M MASK ROM | 1 |
| | IC28 | LC321664AJ80 | 1M BIT DYNAMIC RAM | 1 |
| | **TRANSISTORS** | | | |
| | Q1 | 2SA1643 | TRANSISTOR | 1 |
| S | Q2 | 2SC1815GR | TRANSISTOR | 1 |
| | Q3~5 | 2SB709AR | TRANSISTOR | 3 |
| | Q6 | 2SD601AQ | TRANSISTOR | 1 |
| S | Q7 | 2SA1015-GR | 2SA933STRS (SUB. PART) | 1 |
| | Q8, 10~13 | 2SD601AQ | TRANSISTOR | 5 |
| | **DIODES** | | | |
| | D1 ⚠ | MA2062LF | ZENER, 6.2V | 1 |
| | D2 | MA738 | DIODE | 1 |
| | D3 | MA8030L | ZENER, 2.9V | 1 |
| | D4, 5 | MA110 | DIODE | 2 |
| ○ | D6 | MA8030H | DIODE, SI, 3.1V | 1 |
| | D7~9 | MA110 | DIODE | 3 |
| | D10 | MA8056 | ZENER, 5.6V | 1 |
| | D12 | MA151WK | DIODE | 1 |
| | D13 | MA8056 | ZENER, 5.6V | 1 |
| | D16 | MA110 | DIODE | 1 |
| | **OSCILLATORS** | | | |
| | X1 | QSXG2F2400A | CERAMIC OSCILLATOR | 1 |
| | X2 | QSXG1A1128A | CRYSTAL OSCILLATOR | 1 |
| | X3 | QSXG2F2500A | 25MHz CERAMIC OSCILLATOR | 1 |
| | X4 | QSXG2F2400A | CERAMIC OSCILLATOR | 1 |
| | **COMPONENT COMBINATIONS** | | | |
| | Z1~4 | EXBV8V470J | RESISTOR RESISTOR | 4 |
| | Z10 | EXBV8V101J | 100Ω×4 | 1 |
| | Z11~19 | EXBV8V471J | 470Ω×4 | 9 |
| | Z20 | EXBV8V102J | 1KΩ×4 | 1 |
| | Z21 | EXBS8V103J | 10KΩ×4 | 1 |
| | Z23, 24 | EXBV8V102J | 1KΩ×4 | 2 |
| | Z25 | EXBV8V221J | 220Ω×4 | 1 |
| | Z27, 28 | EXBS8V471J | 470Ω×4 | 2 |
| | Z29 | EXBV8V471J | 470Ω×4 | 1 |
| | Z30, 31 | EXBV8V472J | 4.7KΩ×4 | 2 |
| | Z32 | EXBV8V331J | RESISTOR RESISTOR | 1 |
| | Z33~35 | EXBV8V470J | RESISTOR RESISTOR | 3 |
| | Z36 | EXBV8V471J | 470Ω×4 | 1 |
| | **COIL** | | | |
| | L1 | QLCGTJR10KA | 100μF | 1 |
| | **IC PROTECTOR** | | | |
| | IP1 ⚠ | ICP-N10T104 | IC PROTECTOR | 1 |
| | **RESISTORS** | | | |
| | C32, 101 | ERJ6GEY0R00V | 0Ω | 2 |
| | JP5, 8~10 | ERJ6GEY0R00V | 0Ω | 4 |
| | JR1 | ERD25V0R00 | CARBON FILM RESISTOR | 1 |
| | L3 | ERD25V0R00 | CARBON FILM RESISTOR | 1 |
| | R1 | ERJ6GEYJ101V | 100Ω | 1 |

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| R2 | ERJ6GEYJ470V | 47Ω | 1 |
| R3 | ERJ6GEYJ333V | 33KΩ | 1 |
| R4 | ERJ6GEYJ223V | 22KΩ | 1 |
| R5 | ERJ6GEYJ331V | 330Ω | 1 |
| R7, 8 | ERJ6GEYJ103V | 10KΩ | 2 |
| R9 | ERJ6GEYJ102V | 1KΩ | 1 |
| R10 | ERJ6GEYJ472V | 4.7KΩ | 1 |
| R11 | ERJ6GEYJ333V | 33KΩ | 1 |
| R12 | ERJ6GEYJ102V | 1KΩ | 1 |
| R13 | ERJ6GEYJ222V | 2.2KΩ | 1 |
| R14 | ERJ6GEYJ102V | 1KΩ | 1 |
| R15 | ERJ6GEYJ103V | 10KΩ | 1 |
| R16 | ERJ6GEYJ101V | 100Ω | 1 |
| R17 | ERJ6GEYJ124V | 120KΩ | 1 |
| R18 | ERJ6GEY0R00V | 0Ω | 1 |
| R19 | ERJ6GEYJ683V | 68KΩ | 1 |
| R20 | ERJ6GEYJ470V | 47Ω | 1 |
| R25 | ERJ6GEYJ472V | 4.7KΩ | 1 |
| R26 | ERJ6GEYJ223V | 22KΩ | 1 |
| R28 | ERJ6GEYJ102V | 1KΩ | 1 |
| R29 | ERJ6GEYJ470V | 47Ω | 1 |
| R31 | ERJ6GEYJ682V | 6.8KΩ | 1 |
| R32 | ERJ6GEYJ102V | 1KΩ | 1 |
| R34 | ERJ6GEYJ682V | 6.8KΩ | 1 |
| R35 | ERJ6GEYJ101V | 100Ω | 1 |
| R43~46 | ERJ6GEYJ221V | 220Ω | 4 |
| R47, 49 | ERJ6GEYJ470V | 47Ω | 2 |
| R52, 53 | ERJ6GEYJ222V | 2.2KΩ | 2 |
| R62 | ERJ6GEYJ471V | 470Ω | 1 |
| R63 | ERJ6GEYJ151V | 150Ω | 1 |
| R64 | ERJ6GEYJ472V | 4.7KΩ | 1 |
| R66 | ERJ6GEYJ331V | 330Ω | 1 |
| R72, 73 | ERJ6GEYJ151V | 150Ω | 2 |
| R75 | ERJ6GEY0R00V | 0Ω, M XM | 1 |
| R77 | ERJ6GEYJ103V | 10KΩ | 1 |
| R78 | ERJ6GEYJ104V | 100KΩ | 1 |
| R90, 91 | ERJ6GEYJ472V | 4.7KΩ | 2 |
| R92~94, 96 | ERJ6GEY0R00V | 0Ω | 4 |
| R100 | ERJ6GEYJ221V | 220Ω | 1 |
| R110, 111, 114 | ERJ6GEYJ103V | 10KΩ | 3 |
| R115 ⚠ | ERG1SJ100 | METAL FILM OXIDE RESISTOR, 1W | 1 |
| R116 | ERJ6GEYJ332V | 3.3KΩ | 1 |
| R117 | ERJ6GEYJ472V | 4.7KΩ | 1 |
| R118 | ERJ6GEYJ103V | 10KΩ | 1 |
| R121 | ERJ6GEYJ221V | 220Ω | 1 |
| R122 | ERJ6GEYJ332V | 3.3KΩ | 1 |
| R123 | ERJ6GEYJ222V | 2.2KΩ | 1 |
| R124, 126 | ERJ6GEYJ101V | 100Ω | 2 |
| R128 | ERJ6GEYJ103V | 10KΩ | 1 |
| R130, 131 | ERJ6GEY0R00V | 0Ω | 2 |
| R132 | ERJ6GEYJ103V | 10KΩ | 1 |
| R133 | ERJ6GEYJ473V | 47KΩ | 1 |
| R134 | ERJ6GEYJ470V | 47Ω | 1 |
| **CAPACITORS** | | | |
| C1 | ECA0JM102 | ALUMINIUM CAPACITOR | 1 |
| C3 | ECUV1H221JG | 220pF | 1 |
| C4 | ECUV1H104ZFX | 0.1μF | 1 |
| ○ C5 | ECA1EM470 | ALUMINIUM CAPACITOR | 1 |
| C7 | ECUV1C224KBX | CERAMIC CAPACITOR, MULTI LAYER | 1 |
| C10 | ECUV1H104ZFX | 0.1μF | 1 |
| C11 | ECUV1H030CCN | 3pF | 1 |
| C12~14 | ECUV1H100DCN | 10pF | 3 |
| C15 | ECUV1H223KBX | 0.022μF | 1 |
| C16 | ECUV1H182JX | MULTILAYER CERAMIC CHIP CAPACITOR | 1 |
| C17 | ECUV1H472KBG | 0.0047μF | 1 |

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| C18, 19 | ECUV1H333KBX | 0.033μF | 2 |
| C20~22 | ECUV1H104ZFX | 0.1μF | 3 |
| C23 | ECEA0JKA470 | 47μF, 6.3V | 1 |
| C24 | FM0H473Z | 0.047μ, 5.5V | 1 |
| C26 | ECUV1H104ZFX | 0.1μF | 1 |
| C27, 28 | ECUV1H101JG | 100pF | 2 |
| C31 | ECUV1H104ZFX | 0.1μF | 1 |
| C33~36 | ECUV1H030CCN | 3pF | 4 |
| C38, 43 | ECUV1H104ZFX | 0.1μF | 2 |
| C44 | ECEA1CKA100 | 10μF, 16V | 1 |
| C47, 48 | ECUV1H104ZFX | 0.1μF | 2 |
| C49, 50 | ECUV1H222KX | 0.0022μF | 2 |
| C57 | ECUV1H104ZFX | 0.1μF | 1 |
| C58~62 | ECUV1H101JG | 100pF | 5 |
| C63 | ECUV1H104ZFX | 0.1μF | 1 |
| C64 | ECA0JM102 | ALUMINIUM CAPACITOR | 1 |
| C65~72, 80~91 | ECUV1H104ZFX | 0.1μF | 20 |
| C92 | ECEA1HKA010 | 1μF, 50V | 1 |
| C94 | ECEA0JKA101 | 100μF, 6.3V | 1 |
| C100 | ECUV1H104ZFX | 0.1μF | 1 |
| C105 | ECEA1HKA010 | 1μF, 50V | 1 |
| C106 | ECUV1H470JG | 47pF | 1 |
| C107 | ECA0JM102 | ALUMINIUM CAPACITOR | 1 |
| C109 | ECUV1H104ZFX | 0.1μF | 1 |
| C110 | ECUV1H101JG | 100pF | 1 |
| C111~114, 116~120, 122 | ECUV1H104ZFX | 0.1μF | 10 |
| C123, 124 | ECUV1H101JG | 100pF | 2 |
| C125 | ECUV1H104ZFX | 0.1μF | 1 |
| C126 | ECUV1E473KB | 0.047μF | 1 |
| C127 | ECUV1H101JG | 100pF | 1 |

## CP CONTROL PANEL

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **INTEGRATED CIRCUITS** | | | |
| IC1 | M37471M2196S | 8 BIT MICROCOMPUTER | 1 |
| IC2 | HD74LS138P | 3 TO 8 DECODER | 1 |
| IC3 | HD74LS07P | HEX BUFFERS | 1 |
| **TRANSISTORS** | | | |
| Q1~8 | 2SA830SB | TRANSISTOR | 8 |
| **DIODES** | | | |
| D1~7, 9~14, 17~22, 25~31, 33~39, 41~54, 56~63, 65~71, 73~87, 89~94, 96~104 | MA165 | DIODE | 92 |
| D201~205, 209, 211~213, 238, 242~244, 246, 251~254 | LN382G | LED (GREEN) | 18 |
| D210, 219~222, 225~229, 233~237, 241, 245, 249, 250, 257~260 | LN282R | LED (RED) | 23 |

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **OSCILLATOR** | | | |
| X1 | EF0EC4004A3 | 4MHz, CERAMIC OSCILLATOR | 1 |
| **SWITCHES** | | | |
| S1~7, 9~14, 17~22, 25~31, 33~39, 41~54, 56~63, 65~71, 73~87, 89~94, 97~105 | EVQ21507K | PUSH SWITCH | 92 |
| **VARIABLE RESISTOR** | | | |
| VR1 | EVD07205B24G | 20kΩ, B | 1 |
| **RESISTORS** | | | |
| R1~6 | ERDS2TJ680 | 68Ω | 6 |
| R7~22 | ERDS2TJ103 | 10kΩ | 16 |
| R23 | ERDS2TJ333 | 33kΩ | 1 |
| R24 | ERDS2TJ102 | 1kΩ | 1 |
| R25 | ERDS2TJ101 | 100Ω | 1 |
| R33 | ERDS2TJ102 | 1kΩ | 1 |
| **CAPACITORS** | | | |
| C1~3, 5 | ECRF1H104ZF | 0.1μF | 4 |
| C6 | ECEA0JKA470 | 47μF, 6.3V | 1 |
| C9 | ECRF1H104ZF | 0.1μF | 1 |

## FAJ FILTER & AMP CIRCUIT

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **INTEGRATED CIRCUITS** | | | |
| IC1 | QCPL-260L | PHOTO COUPLER | 1 |
| IC3, 5, 6 | M5218AL | OPERATIONAL AMPLIFIER | 3 |
| ○ IC7 ⚠ | LA4705NA | IC, LINER | 1 |
| **TRANSISTORS** | | | |
| S Q2, 3 | 2SA1015-GR | 2SA933STRS (SUB. PART) | 2 |
| Q4 | 2SB941P | TRANSISTOR | 1 |
| S Q5 | 2SC1815GR | TRANSISTOR | 1 |
| S Q6 | 2SA1015-GR | 2SA933STRS (SUB. PART) | 1 |
| S Q7~9 | 2SC1815GR | TRANSISTOR | 3 |
| S Q10, 11 | 2SA1015-GR | 2SA933STRS (SUB. PART) | 2 |
| S Q14 | 2SC1815GR | TRANSISTOR | 1 |
| **DIODES** | | | |
| D3 ⚠ | SVDS3V20 | RECTIFIER | 1 |
| D7~9 | MA165 | DIODE | 3 |
| D13 | EK04 | DIODE | 1 |
| **COILS** | | | |
| L1 ⚠ | QLQGT2T100SA | COIL | 1 |
| L3, 4, 6, 7 | QLQGT3T150SA | 15μH×3 | 4 |
| L10 | QLQGT1B800MA | 80μH | 1 |

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **JACKS** | | | |
| JK2 | SJSG1370A | MIDI OUT | 1 |
| JK3 | SJSG1370A | MIDI IN | 1 |
| JK5 | QJJG003AA | FOOT SW | 1 |
| JK6 | SJJG440A | DC IN 12V | 1 |
| JK9 | SJJG100A | PHONES | 1 |
| JK10 ⚠ | QJSG006AA | DC IN 12V | 1 |
| **IC PROTECTOR** | | | |
| IP1 ⚠ | ICP-N75T104 | IC PROTECTOR | 1 |
| **RESISTORS** | | | |
| R5 | ERDS2TJ330 | 33Ω | 1 |
| R6 | ERDS2TJ331 | 330Ω | 1 |
| R7 | ERDS2TJ151 | 150Ω | 1 |
| R8 | ERDS2TJ224 | 220kΩ | 1 |
| R9 | ERDS2TJ221 | 220Ω | 1 |
| R10, 12 | ERDS2TJ102 | 1kΩ | 2 |
| R13, 14 | ERDS2TJ153 | 15kΩ | 2 |
| R15, 16 | ERDS2TJ473 | 47kΩ | 2 |
| R17, 18 | ERDS2TJ101 | 100Ω | 2 |
| R19, 20 | ERDS2TJ102 | 1kΩ | 2 |
| R23, 24 | ERG1SJ100 | METAL FILM OXIDE RESISTOR, 1W | 2 |
| R25, 26 | ERG1SJ221 | 220Ω, 1W | 2 |
| R27 | ERDS2TJ104 | 100kΩ | 1 |
| R28 | ERDS2TJ682 | 6.8kΩ | 1 |
| R29 | ERDS2TJ473 | 47kΩ | 1 |
| R30 | ERDS2TJ222 | 2.2kΩ | 1 |
| R31 | ERDS2TJ102 | 1kΩ | 1 |
| R34, 35 | ERDS2TJ222 | 2.2kΩ | 2 |
| R36 | ERDS2TJ103 | 10kΩ | 1 |
| R37, 38 | ERDS2TJ153 | 15kΩ | 2 |
| R39, 40 | ERDS2TJ224 | 220kΩ | 2 |
| R51, 52 | ERDS2TJ103 | 10kΩ | 2 |
| R53, 54 | ERDS2TJ124 | 120kΩ | 2 |
| R55, 56 | ERDS2TJ823 | 82kΩ | 2 |
| R59, 60 | ERDS2TJ103 | 10kΩ | 2 |
| R61, 62 | ERDS2TJ682 | 6.8kΩ | 2 |
| R67~70 | ERD25FVJ2R2 | 2.2Ω, 1/4W, FLAME-PLOOF | 4 |
| R71, 72 | ERDS2TJ103 | 10kΩ | 2 |
| R73 ⚠ | ERD2FCVJ4R7 | 4.7Ω, 1/4W, FUSE TYPE | 1 |
| R79, 80 | ERDS2TJ682 | 6.8kΩ | 2 |
| R81 | ERDS2TJ473 | 47kΩ | 1 |
| **CAPACITORS** | | | |
| J19 | ECKF1E473ZV | 0.047μF | 1 |
| C3 | ECCR1H221J | 220pF | 1 |
| C4~6, 8~11 | ECKF1E473ZV | 0.047μF | 7 |
| C13 | ECA1EM472 | ALUMINIUM CAPACITOR | 1 |
| C15 | ECA1CM331 | ALUMINIUM CAPACITOR | 1 |
| ○ C16 | ECA1CM102 | ALUMINIUM CAPACITOR | 1 |
| C17, 18 | ECQB1H333JF | 0.033μF | 2 |
| C19, 20 | ECQB1H393JF | 0.039μF | 2 |
| ○ C21 | ECA1EM470 | ALUMINIUM CAPACITOR | 1 |
| C25, 26 | ECQG1H152KZ | 0.0015μF | 2 |
| C27, 28 | ECQG1H682KZ | 0.0068μF | 2 |
| C29, 30 | ECQG1H152KZ | 0.0015μF | 2 |
| C32 | ECEA1EKA100 | 10μF, 25V | 1 |
| C33~36 | ECEA1HKA010 | 1μF, 50V | 4 |
| C37, 38 | ECQG1H102KZ | 0.001μF | 2 |
| ○ C39 | ECA1EM470 | ALUMINIUM CAPACITOR | 1 |
| C40 | ECEA0JKA470 | 47μF, 6.3V | 1 |
| C43~46 | ECRF1H104ZF | 0.1μF | 4 |
| C50 | ECEA0JKA470 | 47μF, 6.3V | 1 |
| C51, 52 | ECQV1H684JM | 0.68μF | 2 |



| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| C53, 54 | ECCR1H330J | 33pF | 2 |
| C55, 56 | ECA1CM101 | ALUMINIUM CAPACITOR | 2 |
| C59, 66 | ECKF1E473ZV | 0.047μF | 2 |
| C72 | ECQV1H104JM | 0.1μF | 1 |
| C100 | ECKF1E473ZV | 0.047μF | 1 |
| C101, 102 | ECQG1H472KZ | 0.0047μF | 2 |

## LAMP1 LAMP 1 CIRCUIT

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **LAMPS** | | | |
| ○ LP1, 2 | QHQG005AA | INCANDESCENT LAMP | 2 |

## BATT– BATTERY – CIRCUIT

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **SPRING** | | | |
| SPR1 | SJCG20A | SPRING | 1 |

## MKB1 MANUAL KEYBOARD 1 CIRCUIT

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **INTEGRATED CIRCUIT** | | | |
| IC1 | HD74LS138P | 3 TO 8 DECODER | 1 |
| **DIODES** | | | |
| D1~48 | MA165 | DIODE | 48 |
| **CAPACITORS** | | | |
| C2, 3 | ECRF1H104ZF | 0.1μF | 2 |

## MKB2 MANUAL KEYBOARD 2 CIRCUIT

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **INTEGRATED CIRCUIT** | | | |
| IC2 | HD74LS138P | 3 TO 8 DECODER | 1 |
| **DIODES** | | | |
| D49~96 | MA165 | DIODE | 48 |
| **CAPACITORS** | | | |
| C4, 5 | ECRF1H104ZF | 0.1μF | 2 |
| C6 | ECEA1CKA470 | 47μF, 16V | 1 |

## MKB3 MANUAL KEYBOARD 3 CIRCUIT

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **DIODES** | | | |
| D97~122 | MA165 | DIODE | 26 |

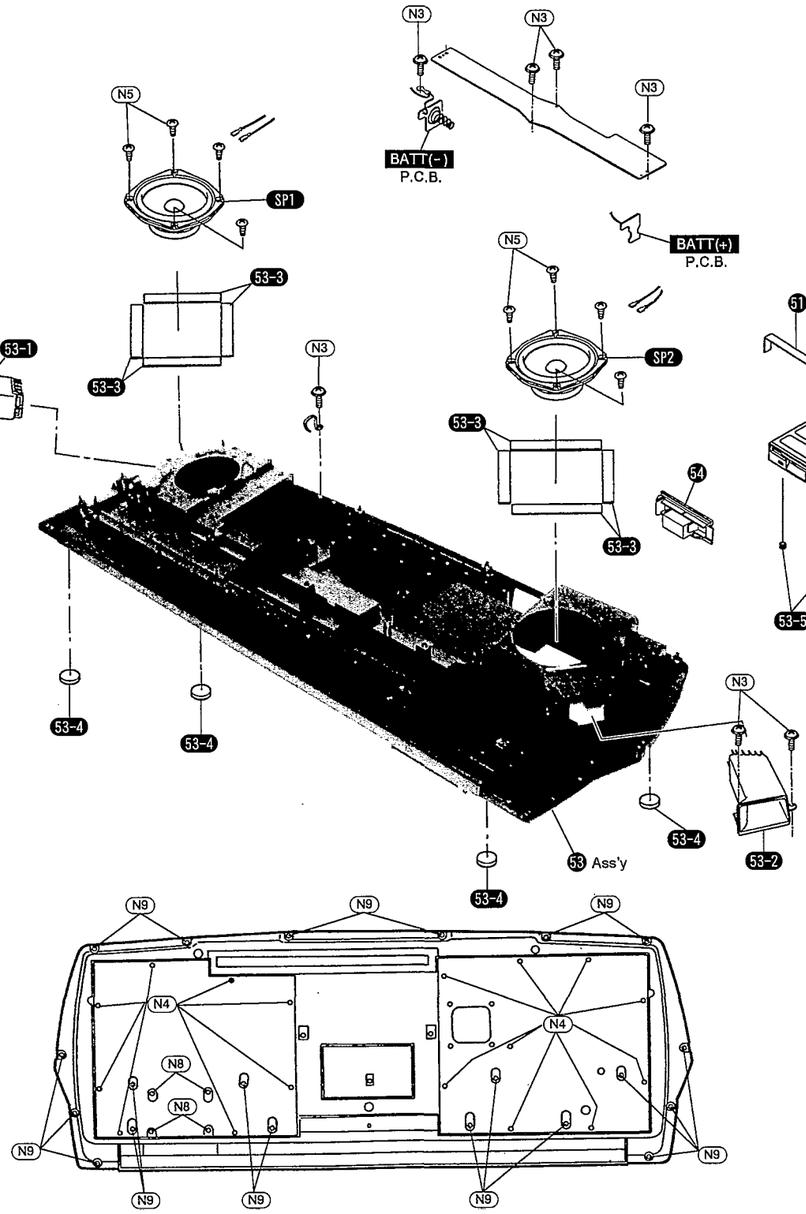
## INS (BEND) PITCH BEND CIRCUIT

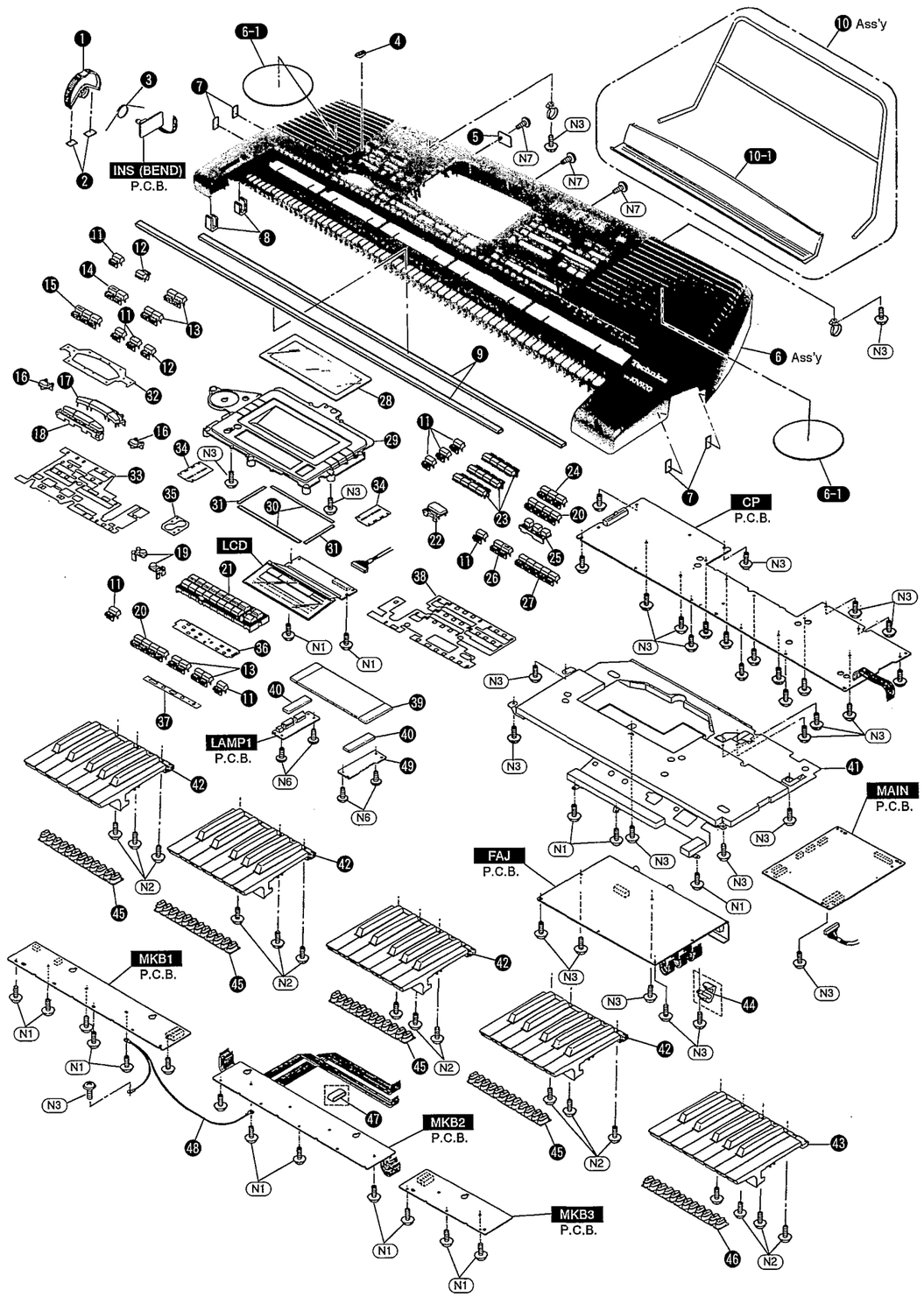
| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **VARIABLE RESISTOR** | | | |
| VR1 | QRVG16A02B54 | 50kΩ, B | 1 |
| **RESISTORS** | | | |
| R1, 2 | ER0S2CKF1001 | 1kΩ, ±1% | 2 |

## ■WIRING PARTS

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| ○ W1 | QEXGSS03008B | COMMU CABLE W/ PLUG | 1 |
| ○ W2 | QEXGVH06105B | COMMU CABLE W/ PLUG | 1 |
| ○ W3 | QEXGZA34055A | COMMU CABLE W/ PLUG | 1 |
| ○ W4 | QEXGSS14050B | COMMU CABLE W/ PLUG | 1 |
| ○ W5 | QEUGS8W10BZ | COMMU CABLE W/ PLUG | 1 |
| ○ W6 | QEUGS7W30BZ | COMMU CABLE W/ PLUG | 1 |
| ○ W7 | QEUGSAW30BZ | COMMU CABLE W/ PLUG | 1 |
| ○ W8 | QEUGS8W06BZ | COMMU CABLE W/ PLUG | 1 |
| ○ W9 | QEUGS3W10BZ | COMMU CABLE W/ PLUG | 1 |
| ○ W10 | QEUGS8W06BZ | COMMU CABLE W/ PLUG | 1 |
| ○ W11 | QEUGS7W06BZ | COMMU CABLE W/ PLUG | 1 |
| ○ W12 | QEUGS6W06BZ | COMMU CABLE W/ PLUG | 1 |
| ○ W13 | QEUGSAW08BZ | COMMU CABLE W/ PLUG | 1 |
| ○ W14 | QEUGS9W06BZ | COMMU CABLE W/ PLUG | 1 |
| ○ W15 | QEUGS8W08BZ | COMMU CABLE W/ PLUG | 1 |

# CABINET PARTS LOCATION



# REPLACEMENT PARTS LIST.....Cabinet and Chassis Parts

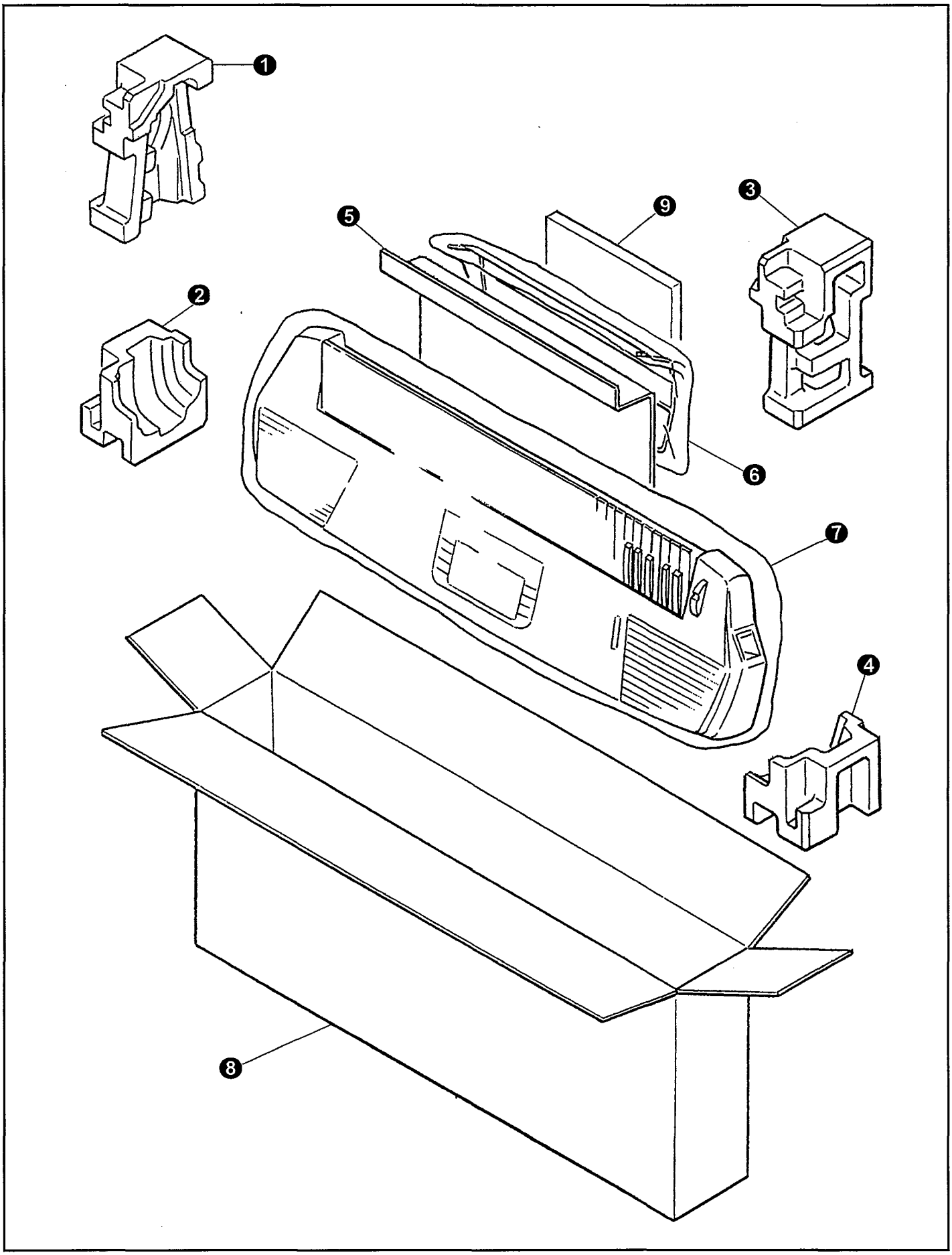
**Notes:**

1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retension period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. ○ mark are new parts.
3. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
4. For part No. with area mark, check the area when placing an order.
5. The raw material indication for synthetic resin
   In order to facilitate classification of parts of synthetic resin manufacture and to promote the recycling of natural resources, a raw material symbol for such parts is indicated in the Ref. No./ Material column.

## ■CABINET & CHASSIS PARTS

| | Ref. No. | | Part No. | Description | P/S |
|---|---|---|---|---|---|
| | | | **SPEAKERS** | | |
| | SP1, 2 | | EAS12P458A3 | SPEAKER, 12cm, 4Ω | 2 |
| | | | **CABINET PARTS** | | |
| | 1 | ABS | SBNG4050A | WHEEL KNOB | 1 |
| | 2 | | QMFG4076AAK | FELT | 2 |
| | 3 | | QMBG012AAK | SPRING | 1 |
| | 4 | ABS | SBNG7070B | KNOB, MAIN VOLUME | 1 |
| | 5 | PS | QKSGF007AA | DC IN COVER | 1 |
| ○ | 6 | | QYPG1071BAK | CABINET BODY | 1 |
| | 6-1 | | [ QMFG4128AAK | SPEAKER NET | 2 |
| | 7 | | QMFG4110AA | FELT | 4 |
| | 8 | | QMFG4167AAK | CUSHION | 2 |
| | 9 | | SHSG1970A | FELT | 2 |
| | 10 | ⚠ | QYAG3004AAK | MUSIC STAND ASS'Y | 1 |
| | 10-1 | PS | [ QMRG7065AAK | TABLE OF MUSIC BOOK | 1 |
| ○ | 11 | ABS | QGUG1435AAK | PUSH BUTTON | 9 |
| ○ | 12 | ABS | QGUG1435ABK | PUSH BUTTON | 2 |
| ○ | 13 | ABS | QGUG1436AAK | PUSH BUTTON | 4 |
| ○ | 14 | ABS | QGUG1436AA1K | PUSH BUTTON | 1 |
| ○ | 15 | ABS | QGUG1437AA1K | PUSH BUTTON | 1 |
| ○ | 16 | ABS | QGUG1367ACK | PUSH BUTTON | 2 |
| ○ | 17 | ABS | QGUG1385AB1K | PUSH BUTTON | 1 |
| ○ | 18 | ABS | QGUG1384AB1K | PUSH BUTTON | 1 |
| ○ | 19 | ABS | QGUG1392BBK | PUSH BUTTON | 2 |
| ○ | 20 | ABS | QGUG1438AAK | PUSH BUTTON | 2 |
| | 21 | ABS | QGUG1420AA | PUSH BUTTON | 1 |
| ○ | 22 | ABS | QGUG1366ACK | PUSH BUTTON | 1 |
| ○ | 23 | ABS | QGUG1438ABK | PUSH BUTTON | 3 |
| ○ | 24 | ABS | QGUG1437AAK | PUSH BUTTON | 1 |
| ○ | 25 | ABS | QGUG1369BCK | PUSH BUTTON | 1 |
| ○ | 26 | ABS | QGUG1436AA2K | PUSH BUTTON | 1 |
| ○ | 27 | ABS | QGUG1439AAK | PUSH BUTTON | 1 |
| ○ | 28 | | QKWG029AAK | PLATE | 1 |
| ○ | 29 | PS | QGPG0120ABK | ORNAMENT, PS | 1 |
| ○ | 30 | | QMRG5123AAK | CUSHION | 2 |
| ○ | 31 | | QMRG5124AAK | CUSHION | 2 |
| ○ | 32 | | QMRG5137AAK | CUSHION | 1 |
| ○ | 33 | | QMFG4179AAK | CUSHION | 1 |
| ○ | 34 | | QMFG4183AAK | CUSHION | 2 |
| ○ | 35 | | QMRG5138AAK | CUSHION | 1 |
| ○ | 36 | | QMFG4184AAK | CUSHION | 1 |
| ○ | 37 | | QMFG4181AAK | CUSHION | 1 |
| ○ | 38 | | QMFG4180AAK | CUSHION | 1 |
| ○ | 39 | | QMRG7080AA | PLATE | 1 |
| ○ | 40 | | QMRG5121AAK | SPACER | 2 |
| ○ | 41 | | QSCG092AK | MAGNETIC SHIELD | 1 |
| | 42 | ABS | QMWG9020AAK | 12 KEYS | 4 |
| | 43 | ABS | QMWG9021AAK | 13 KEYS | 1 |
| | 44 | | QLZG006A | CORE, EN M MC XM EZ EK EW EF EA EP EH XL XR XP | 1 |
| | 45 | | QMWG6015CAK | RUBBER SWITCH (12 PCS.ON ONE) | 4 |
| | 46 | | QMWG6014CAK | RUBBER SWITCH (13 PCS.ON ONE) | 1 |
| | 47 | ⚠ | QLZG013A | CORE, EN M MC XM EZ EK EW EF EA EP EH XL XR XP | 1 |
| ○ | 48 | | QEXGRA01020F | WIRE | 1 |
| ○ | 49 | | SXPG226811F | LAMP2 | 1 |
| | 50 | | QMFG4103AA | FELT | 1 |
| | 51 | | QMFG1204AA | FELT | 1 |
| | 52 | | QAUG012AA | DDR DRIVE UNIT | 1 |
| ○ | 53 | | QYKG192CAK | CABINET BODY | 1 |
| ○ | 53-1 | PS | QMRG7078ABK | SOUND PORT, LEFT | 1 |
| ○ | 53-2 | PS | QMRG7079ABK | SOUND PORT, RIGHT | 1 |
| ○ | 53-3 | | QMRG5099AAK | CUSHION | 8 |
| | 53-4 | | QMRG7070AAK | FOOT | 4 |
| | 53-5 | | QMGG041AA | SPACER | 4 |
| ○ | 54 | | QKSGF019AA | BATTERY COVER | 1 |
| | | | **SCREWS & WASHERS** | | |
| | N1 | | XTW3+10QFZ | SCREW | 16 |
| | N2 | | XTW3+20Q | SCREW | 16 |
| | N3 | | XTW3+12Q | SCREW | 48 |
| | N4 | | XTT4+20AFZ | SCREW | 17 |
| | N5 | | XTV3+10GFZ | SCREW | 8 |
| | N6 | | XTV3+12G | SCREW | 4 |
| | N7 | | XTW3+14TFZ | SCREW | 3 |
| ○ | N8 | | QHDG043AA | SCREW WITH WASHER | 4 |
| | N9 | | XTW3+20QFZ | SCREW | 24 |

# PACKING



## ■PACKING PARTS

| Ref. No. | Part No. | Description | P/S |
|---|---|---|---|
| **PACKING PARTS** | | | |
| ○ 1 PS | QPNG0584AAK | PAD | 1 |
| ○ 2 PS | QPNG0582AAK | PAD | 1 |
| ○ 3 PS | QPNG0583AAK | PAD | 1 |
| ○ 4 PS | QPNG0581AAK | PAD | 1 |
| ○ 5 | QPGG0349AAK | CUSHION, PAPER | 1 |
| 6 PE | SPHG1770A | POLYETHYLENE BAG | 1 |
| 7 PE | QPFG002AA | POLYETHYLENE BAG | 1 |
| ○ 8 | QPGG0348AAK | PACKING CASE, PAPER | 1 |
| **OPERATING INSTRUCTION MANUAL** | | | |
| ○ 9 | QQFGKN1500AA | OPERATING INSTRUCTION MANUAL, EN | 1 |
| ○ 9-1 | QQTG0405A | DANSK | 1 |
| ○ 9-2 | QQTG0406A | ENGLISH | 1 |
| ○ 9 | QQFGKN1500BA | OPERATING INSTRUCTION MANUAL, M | 1 |
| ○ 9 | QQFGKN1500CA | OPERATING INSTRUCTION MANUAL, MC | 1 |
| ○ 9-1 | QQTG0406A | ENGLISH | 1 |
| ○ 9-2 | QQTG0408A | FRANCAIS | 1 |
| ○ 9 | QQFGKN1500DA | OPERATING INSTRUCTION MANUAL, EZ | 1 |
| ○ 9 | QQFGKN1500EA | OPERATING INSTRUCTION MANUAL, EK XS XL XR | 1 |
| ○ 9 | QQFGKN1500FA | OPERATING INSTRUCTION MANUAL, EW | 1 |
| ○ 9-1 | QQTG0408A | FRANCAIS | 1 |
| ○ 9-2 | QQTG0409A | DEUTSCH | 1 |
| ○ 9-3 | QQTG0410A | ITALIANO | 1 |
| ○ 9 | QQFGKN1500GA | OPERATING INSTRUCTION MANUAL, EF | 1 |
| ○ 9-1 | QQTG0408A | FRANCAIS | 1 |
| ○ 9-2 | QQTG0410A | ITALIANO | 1 |
| ○ 9 | QQFGKN1500HA | OPERATING INSTRUCTION MANUAL, EA | 1 |
| ○ 9 | QQFGKN1500JA | OPERATING INSTRUCTION MANUAL, EP XP XM | 1 |
| ○ 9-1 | QQTG0406A | ENGLISH | 1 |
| ○ 9-2 | QQTG0412A | ESPANOL | 1 |
| ○ 9 | QQFGKN1500KA | OPERATING INSTRUCTION MANUAL, EH | 1 |
| ○ 9-1 | QQTG0411A | NERDERLANDS | 1 |
| ○ 9-2 | QQTG0408A | FRANCAIS | 1 |
| ○ 9-3 | QQTG0409A | DEUTSCH | 1 |
| ○ 9 | QQFGKN1500LA | OPERATING INSTRUCTION MANUAL, X | 1 |
| ○ 9-1 | QQTG0406A | ENGLISH | 1 |
| ○ 9-2 | QQTG0412A | ESPANOL | 1 |
| ○ 9-3 | QQTG0413A | 中文 | 1 |
| ○ 9 | QQFGKN1500MA | OPERATING INSTRUCTION MANUAL, XD | 1 |
| ○ 9-1 | QQTG0406A | ENGLISH | 1 |
| ○ 9-2 | QQTG0413A | 中文 | 1 |
| ○ 9 | QQFGKN1500NA | OPERATING INSTRUCTION MANUAL, XT | 1 |

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